REMEDIAL SITE ASSESSMENT DECISION - EPA NEW ENGLAND

Site Name: Mallory Industries, Inc. **EPA ID#:** CTD001148568

Alias Site Names:

Address: 33 Spring Lane **City:** Farmington **State:** CT

Refer to Report Dated: 07-11--97 **Report type:** SIP

Report developed by: RFW /CoE

DECISION:

| | **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

| | 1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)

| | 1b. Site may qualify for further action, but is deferred to: | | RCRA | | NRC

|X| **2. Further Assessment Needed Under CERCLA:** 2a. (optional) Priority: |X | Higher | | Lower

2b. Activity Type: | | PA | | ESI | | SI | | HRS evaluation

|X| Other: Further evaluation needed

DISCUSSION/RATIONALE:

There is a potential release to the surface water and potential contamination of surface water targets.

There has been a release to groundwater and contamination of groundwater targets.

Report Reviewed and Approved by:

Don Smith Signature: Don Smith Date: July 11, 1997

Site Decision Made by:

Don Smith Signature: Don Smith Date: July 11, 1997

EPA Form # 9100-3

FINAL SITE INSPECTION PRIORITIZATION REPORT
FOR
MALLORY INDUSTRIES, INC.
FARMINGTON, CONNECTICUT

CERCLIS No. CTD001148568
TDD No. 9502-09-CWX
Delivery Order No. 0002

Prepared by:

Roy F. Weston, Inc.
67 Batterymarch Street
Boston, Massachusetts 02110

July 11, 1997

ROY F. WESTON, INC.

Reviewed and Approved:

Task Manager — Date 7/11/97

Delivery Order Manager (or designee) — Date 7/11/97

QA Review — Date 11 July 97

Work Order No. 10971-002-030-0007

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the U.S. Army Corps of Engineers New England Division and Roy F. Weston, Inc. (WESTON®). Professional services performed and reports generated by WESTON have been prepared for EPA Region I purposes as described in the contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. WESTON therefore expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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Final Site Inspection Prioritization Report
Mallory Industries, Inc.
Farmington, Connecticut

CERCLIS No. CTD001148568
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INTRODUCTION

Roy F. Weston, Inc. (WESTON®) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the Mallory Industries, Inc. (Mallory) property at 33 Spring Lane in Farmington, Connecticut. Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by the EPA Region I. A Screening Site Inspection (SSI) Report for the Mallory property was prepared by the NUS Corporation Field Investigation Team on July 10, 1990. Wastes generated from on-site operations reportedly included mineral spirits, spent acid dipping solution, and scrap metal. On-site soil samples collected by NUS\FIT documented one semivolatile organic compound and six inorganic elements at or near on-site source areas. On the basis of the information provided in the SSI Report, the Mallory SIP was initiated.

EPA Region I has also requested WESTON to perform SIP investigations on 15 facilities, including Mallory, which are located within and adjacent to the Farmington Industrial Park (FIP) in Farmington and Plainville, Connecticut. For the purposes of this report, these 15 facilities will be referred to as the FIP area.

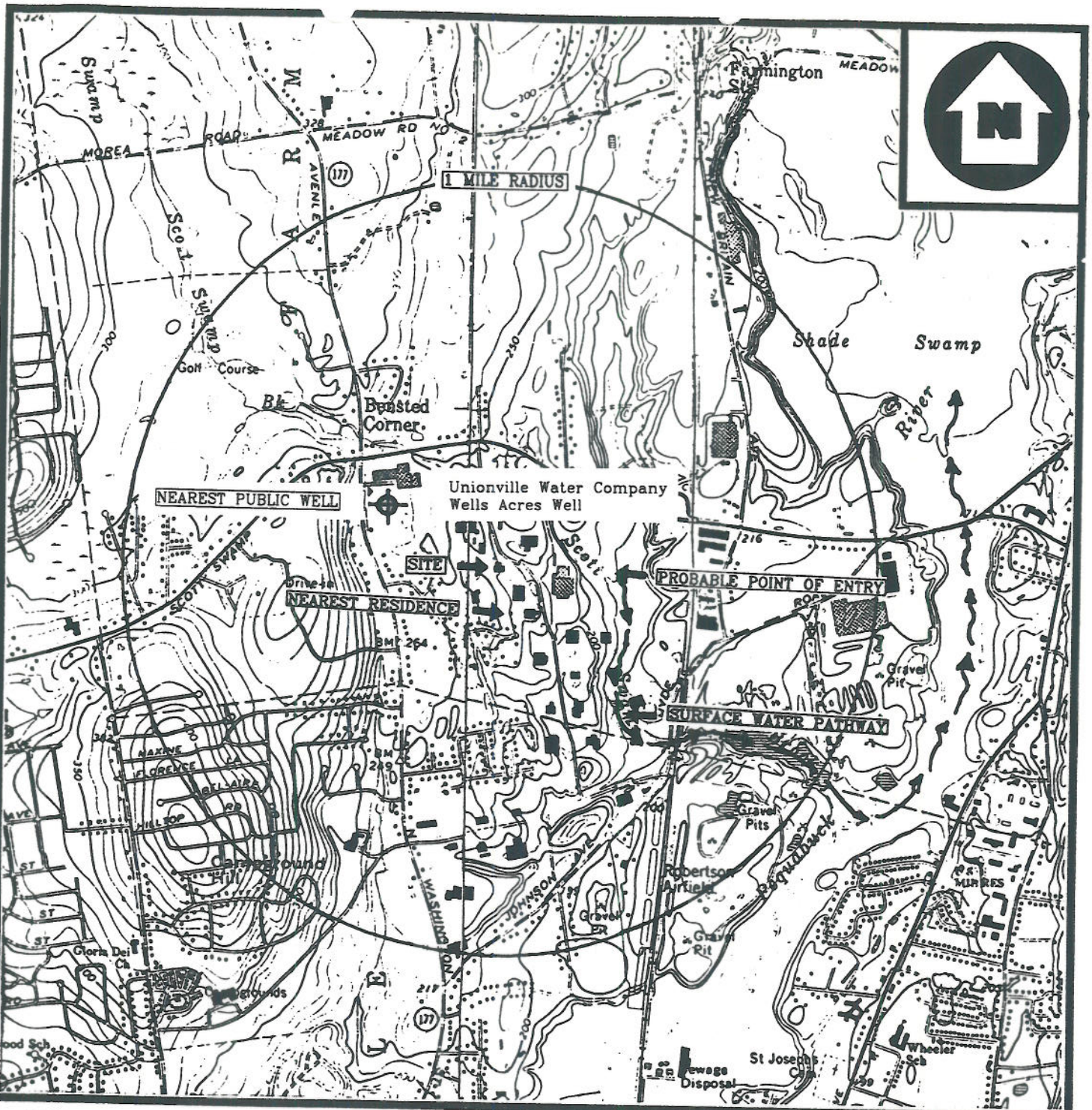
Background information used in the generation of this report was obtained through file searches conducted at EPA Region I and the Connecticut Department of Environmental Protection (CT DEP), telephone interviews with town officials, conversations with persons knowledgeable of the Mallory property and conversations with other Federal, State, and local agencies. Additional information was gathered during the WESTON on-site reconnaissance on June 19, 1995 and WESTON environmental sampling on July 12, 1995.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. These documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

The Mallory property is located in the FIP at 33 Spring Lane, Farmington, Hartford County, Connecticut at geographic coordinates 41° 42' 07.3" north latitude and 72° 52' 23.4" west longitude (Figure 1A and 1B) [2; 3]. According to the Farmington Town Assessor, the Mallory

Note: Text which appears in italics indicates original portions of the Screening Site Inspection Report which were either copied or paraphrased.



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' U.S.G.S. QUADRANGLE(S):
NEW BRITAIN, CT, 1966, PHOTOREVISED 1992; BRISTOL, CT, 1966, PHOTOREVISED 1984

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

QUADRANGLE LOCATION: NEW BRITAIN, CONNECTICUT

LOCATION MAP

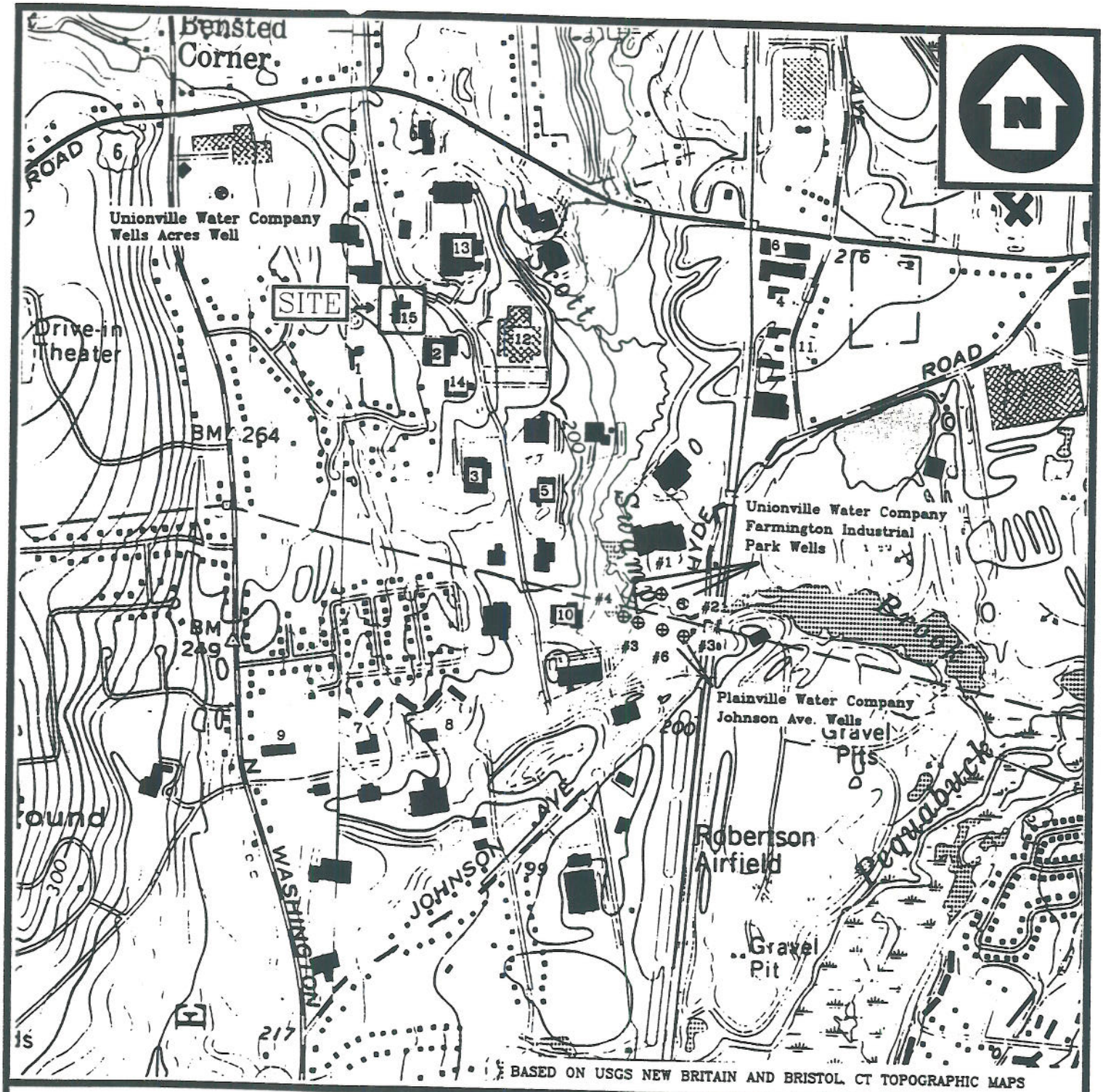
MALLORY INDUSTRIES, INC.

FARMINGTON, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1A

J:\PROJECTS\10971002\030\FIG1A.DWG



LEGEND

1 – Dell Manufacturing Co.
2 – Edmunds Manufaturing Co.
3 – Fletcher-Terry Company
4 – Gros-ite Ind., Inc.
5 – Kip, Inc.
6 – Whitnon-Spindle
7 – American Tool and Manufacturing
8 – Brown Manufaturing
9 – ESCO Laboratories
10 – Mott Metallurgical Co.
11 – Roy Machinery and Sales
12 – Connecticut Spring & Stamping
13 – New England Aircraft Plant No. 1
14 – New England Aircraft Plant No. 2
15 – Mallory Industries

AREA MAP

FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1B

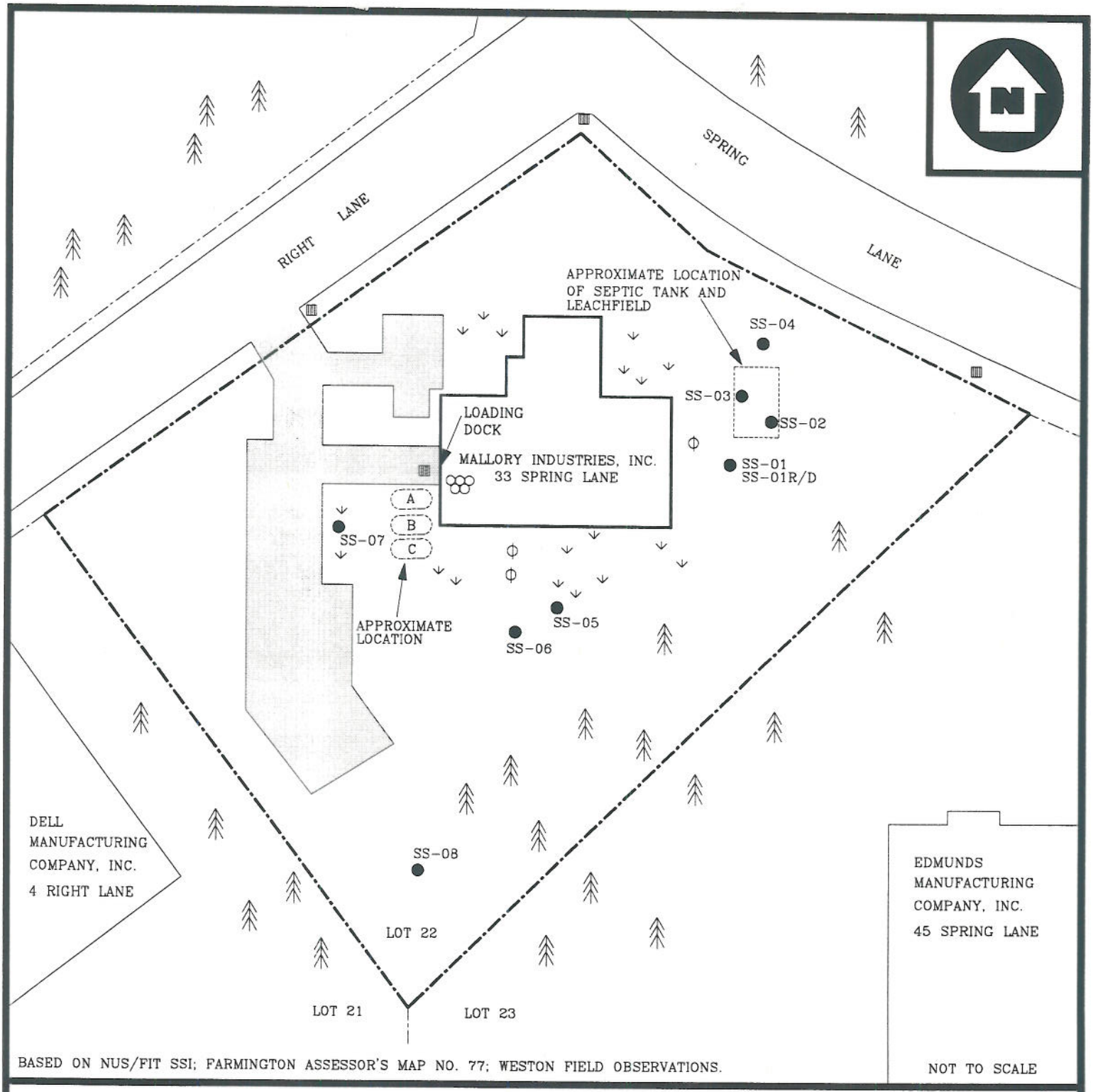
property is depicted on Map 77, Lot No. 22 [30]. The property is approximately 3.7 acres and is occupied by a 22,000-square foot (sq ft) single story manufacturing building [1, p. 2; 5]. The Mallory property is currently owned and operated by Mr. Edwin C. Mallory [2].

Mallory began operations at this location in 1965 [1, p. 2]. Mallory is an active manufacturing company currently producing parts for aircraft and other machinery [2]. The surrounding area is zoned for mixed industrial use. The property is abutted to the northwest by Right Lane, to the northeast by Spring Lane, to the southeast by Edmunds Manufacturing Company (CERCLIS No. CTD054187455), and to the southwest by Dell Manufacturing Company (CERCLIS No. CTD001139336) (Figure 2) [1, p. 2; 53, p. 2]. The Mallory property can be accessed from the north using Right Lane [30; 68]. There are no fences or gates surrounding the property [2]. Paved parking areas are located along the northwest, west, and southwest sides of the manufacturing building [2; 30; 68]. An active loading dock is located along the west side of the manufacturing building [68]. The south and southeastern perimeter of the property is wooded; the remainder of the property is covered by maintained lawns (Figure 2) [68]. The property slopes gradually from the northwest to the southeast [24; 30].

Overland flow, from the Mallory property is directed to the southeast and collected at a storm water catch basin along Spring Lane [30; 68]. Overland flow collected at the storm water catch basin travels south along Spring Lane and discharges to a drainage swale approximately 0.2 miles southeast of the Mallory property [30; 56]. The drainage swale joins a fairly diffuse intermittent stream channel which crosses several residential and commercial properties, mostly via an underground pipe, traveling south and southeast. The intermittent stream channel ultimately discharges into Scott Swamp Brook just south of the confluence of the West Branch of Scott Swamp Brook and Scott Swamp Brook [56]. The total overland flow distance is approximately 0.52 miles [56].

Based on observations made by WESTON during the June 19, 1995 on-site reconnaissance, an interior drum storage area is located at the west end of the manufacturing building by the loading dock (Figure 2) [68]. Approximately 26 55-gallon drums are currently located inside the manufacturing building at the drum storage area [68]. No staining was observed on the property during the WESTON on-site reconnaissance.

Based on available file information, three drywells are located on the property [1]. One drywell and associated drainage ditch are located east of the manufacturing building; in addition, two drywells, used to collect roof drainage, are located south of the manufacturing building (Figure 2) [2; 68]. The locations of two 550-gallon underground storage tanks (USTs) were inspected during the WESTON on-site reconnaissance [68]. The USTs are located along the exterior southwest corner of the manufacturing building (Figure 2). The USTs are of fiberglass construction and were reportedly used to store spent mineral spirits and waste water soluble oils prior to off-site disposal. The USTs are reportedly no longer used. A floor drain, that was reportedly sealed, was identified at the east end of the manufacturing building. In addition, a wastewater treatment tank is located at the east end of the manufacturing building [68]. No monitoring wells were observed at the Mallory property during the WESTON on-site reconnaissance [2, p. 5].



SITE SKETCH
MALLORY INDUSTRIES, INC.
FARMINGTON, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2

Based on available file information and discussions with facility representatives, a former septic system, which includes a leachfield, was used to dispose sanitary wastes. The exact location and size of the system could not be confirmed; however, reports indicate that the septic system is located northeast of the manufacturing building [1, p. 2; 31; 35]. Prior to 1985, wastewaters from machining processes were reportedly discharged to the drywell located northeast of the manufacturing building [1, p. 7]. During the 1989 NUS Corporation Field Investigation Team (NUS/FIT) SSI, two areas of stressed vegetation were observed in the vicinity of this drywell [1, p. 2]. Prior to the installation of the two 550-gallon USTs in 1983, waste solvents and oils were reportedly stored in a former 550-gallon UST located southwest of the manufacturing building (Figure 2) [1, p. 2]. The former 550-gallon UST was reportedly installed in 1976 and removed in 1983 [4]. Waste oils, mineral spirits, and waste solvents, were reportedly stored in 55-gallon drums inside the manufacturing building, prior to the use of the USTs [1, p. 2].

The nearest residence is located approximately 900 feet south of the Mallory property at 29 Wells Drive, Farmington, Connecticut (Figure 1A) [30]. The nearest private drinking water well is located approximately 1.2 miles northwest of the Mallory property and serves an estimated three people [53, pp. 9-10]. The nearest public drinking water well is the Wells Acres Well, which is operated by the Unionville Water Company (UWC), serving an estimated 457 people and is located 0.28 miles northwest of the Mallory property (Figure 1A).

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

Prior to development in 1965, the Mallory property and surrounding properties were used for agricultural purposes [1, p. 1]. Mallory began operating at its current location in 1965 [1, p. 2]. The property is currently owned by Mr. Mallory. No known previous owners of the Mallory property were identified [2]. Mallory has been a manufacturer of aircraft and machine parts since 1965 [1, p. 2]. Processes used at the manufacturing building include but are not limited to; general metal machining (drilling, turning, grinding, and, milling), acid dipping and washing, and parts degreasing [1, pp. 2-3]. Processes at Mallory have remained relatively unchanged since 1965; however, chemicals used and wastes generated at the property may have varied throughout Mallory's operational history due to industry technological advances. Wastes generated from on-site operations include waste oils, mineral spirits, solvents, treatment sludge from the wastewater treatment system, scrap metals, and process wastewater from on-site manufacturing processes.

In November 1970, a Connecticut Water Resources Commission (CT WRC) inspection reported that wastes generated from manufacturing processes at Mallory included scrap metal, water soluble oils, detergents, and abrasive stone. Sanitary wastes were reportedly "discharged to the ground".

In February 1980, a CT DEP inspection documented the discharge of wastes from the tumbling operation to on-site floor drains and septic system. The inspection also stated that waste solvents and oils were collected in a 550-gallon holding tank and hauled off-site. Previously, these wastes were reportedly stored in 55-gallon drums staged within the manufacturing building. At the time of the inspection, sanitary wastes were discharged to the septic system. Wastes from the tumbling operation consisted of water soluble oils, mineral spirits, alkaline soap solution, nitric acid, phosphoric acid, and hot water [1, p. 2-3; 35]. The exact period that this practice had occurred is not known.

In 1981, Mallory filed a notification of Hazardous Waste Activity with the EPA (EPA ID CVS024248900). In connection with that notification, Mallory was designated as a large quantity generator with EPA identification number CTD001148568 [28]. On September 2, 1982, Mallory requested a change of status to a small quantity generator under RCRA [28].

In March 1983, NUS/FIT completed a Preliminary Assessment (PA) Report of the Mallory property. According to a CT DEP UST Facility Notification Form, the 550-gallon UST was removed in 1983 [4]. The property owner confirmed the removal of the UST and stated that the UST was formerly located along the southwest side of the manufacturing building [36]. According to the Facility Notification Form, this UST was installed in January 1976; however, according to an EPA Notification of Hazardous Waste Site form and the NUS/FIT PA, the 550-gallon UST had been installed in 1978 [4; 69]. No known confirmatory samples associated with the UST removal are available. In addition, no information is available regarding the disposal of the UST. In 1983, a new 550-gallon waste solvent UST and a new 550-gallon waste oil UST were installed along the southwest corner of the manufacturing building [69].

In July 1985, Burton and Van Houten Engineers, Inc., of West Hartford, Connecticut completed an engineering proposal for a new wastewater treatment system for Mallory [1, p. 3; 31]. In 1986, after receiving CT DEP approval, Mallory completed the installation of the wastewater treatment system [1, p. 3]. From approximately 1965 to 1986, wastewater generated during manufacturing processes at Mallory was reportedly discharged to the on-site drywell located along the northeast side of the manufacturing building [1, p. 3; 2]. Wastewater discharge to the drywell reportedly ceased once the wastewater treatment system went on-line [31]. Wastewater processed through the wastewater treatment system has since been discharged to the municipal sewer system [1, p. 3]. The waste treatment sludge produced during the wastewater treatment process is disposed off-site. In 1987, Mallory reportedly sealed the floor drains which lead to the sanitary sewer [1, p. 3]. No additional information is available regarding this event.

In August 1989, NUS/FIT conducted an on-site reconnaissance and environmental sampling at the Mallory property as part of the SSI [1]. NUS/FIT collected ten soil samples from the Mallory property, including a background soil sample, a replicate/duplicate soil sample, and a trip blank sample (Figure 2) [1, Table 3]. NUS/FIT on-site soil samples were analyzed through the EPA Contract Laboratory Program (CLP) for target compound list organics and target analyte list metals [1, p. 6]. One semivolatile organic compound (SVOC) and six inorganic elements were detected in NUS/FIT soil samples collected at the Mallory property [1, Attachment D and E]. Analytical results from the NUS/FIT sampling event are discussed in further detail in the Waste/Source Sampling Section of this report.

In addition to the NUS/FIT on-site samples, three soil samples were collected by CT DEP on August 14, 1989 from various locations on the Mallory property. CT DEP soil samples were analyzed for hydrocarbons and chlorinated solvents; however, the exact analytical method used is not known [1]. Laboratory results indicated that there were no hydrocarbons or chlorinated solvents present in CT DEP on-site soil samples [1]. The exact locations where CT DEP soil samples were collected from the Mallory property are not known. Analytical results from the 1989 CT DEP sampling event are discussed in further detail in the Waste/Source Sampling Section of this report.

In 1994, CT DEP conducted additional on-site soil sampling to evaluate conditions at the Mallory property [29]. CT DEP collected one soil sample from the bottom of the drywell located along the northeast side of the manufacturing building (Figure 2) [29]. The exact analytical method used to analyze the soil sample is not known. Laboratory results indicated that 16 organic substances were detected [29]. Analytical results from the 1994 CT DEP sampling event are discussed in further detail in the Waste/Source Sampling Section of this report.

On June 19, 1995, WESTON conducted an on-site reconnaissance as part of the SIP to evaluate present on-site conditions at the Mallory property [2]. On July 12, 1995, WESTON collected eleven groundwater, 21 sediment and two surface water samples at locations up-gradient and down-gradient of the Mallory property [53]. WESTON samples were submitted through the EPA CLP for volatile organic compound (VOC), SVOC, pesticide, polychlorinated biphenyl (PCB), total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory [15]. The results of this sampling event are further summarized in the Groundwater and Surface Water Pathway Sections of this report.

There are currently nine potential source areas at the Mallory property. These include a drywell located northeast of the manufacturing building, two drywells located south of the manufacturing building, a septic tank and associated leachfield located northeast of the manufacturing building, an abandoned 550-gallon waste oil UST and an abandoned 550-gallon waste solvent UST located southwest of the manufacturing building, a former 550-gallon UST formerly located southwest of the manufacturing building, a drum storage area used to store both waste and virgin materials located at the west end, inside the manufacturing building near the loading dock, and an area of contaminated soil [1; 4; 29; 31; 35; 36; 68]. The area of contaminated soil is based on NUS/FIT on-site sampling results and on-site observations. No other treatment, storage or disposal activities are known to have occurred at the property which may have resulted in additional source areas.

Table 1 presents the structures or areas identified on the Mallory property which are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source [1; 4; 29; 31; 35; 36; 68].

Table 1

Source Evaluation for Mallory Industries, Inc.

Source Area	Containment Factors	Spatial Location
Drywell (1)	Designed to release process wastewater to groundwater without treatment. No groundwater monitoring system is in place; was formerly buried beneath more than two feet of soil. Therefore, contained with regard to potential surficial soil and air releases.	Located northeast of the manufacturing building.

Table 1

Source Evaluation for Mallory Industries, Inc. (concluded)

Source Area	Containment Factors	Spatial Location
Drywell (2)	Designed to release stormwater to groundwater without treatment. No groundwater monitoring system is in place; was formerly buried beneath more than two feet of soil. Therefore, contained with regard to potential surficial soil and air releases.	Located south of the manufacturing building.
Septic Tank and Associated Leachfield	Designed to release wastewater to groundwater without treatment. No groundwater monitoring system is in place; was formerly buried beneath more than two feet of soil. Therefore, contained with regard to potential surficial soil and air releases.	Approximate location northeast of manufacturing building.
Abandoned 550-gallon Waste Oil UST	No groundwater monitoring system is in place; was formerly buried beneath more than two feet of soil. Therefore, contained with regard to potential surficial soil and air releases.	Located southwest of manufacturing building.
Abandoned 550-gallon Waste Solvent UST	No groundwater monitoring system is in place; was formerly buried beneath more than two feet of soil. Therefore, contained with regard to potential surficial soil and air releases.	Located southwest of manufacturing building.
Former 550-gallon UST	No groundwater monitoring system is in place; was formerly buried beneath more than two feet of soil. Therefore, contained with regard to potential surficial soil and air releases.	Located southwest of manufacturing building.
Drum Storage Area	Drums are kept on a concrete pad inside the manufacturing building. The drum storage area is contained with regard to potential soil, surface water, and groundwater releases.	Located inside along west end of the manufacturing building, in the vicinity to the loading dock.
Contaminated Soil	None, available for potential release to soil, air, surface water and groundwater.	Based on on-site soil samples and observations.

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, generated, or stored on the Mallory property [1, p. 2-3; 31; 36; 69].

Table 2

Hazardous Waste Quantity for Mallory Industries, Inc.

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Waste Oils, Mineral Spirits, and Solvents	500 gpy*	1965 to 1978 1978 to 1983 1983 to unknown Present	1965 to 1978 1978 to 1983 1983 to unknown Present	55-gallon drums/off-site Former 550-gallon UST (2) 550-gallon USTs Treated/off-site
Treatment Sludge Waste	2,000 gpy	1986 to present	1986 to present	55-gallon drums/off-site
Scrap Metal	2 drums per year	1965 to present	1965 to present	Unknown
Process Wastewater	30,000 gpy*	Unknown to 1985 1986 to present	Unknown to 1985 1986 to present	Drywell On-site treatment/municipal sewer

* - Approximate quantities based on available information and conservative calculations.

As of July 1995, 21 CERCLA properties were located in Farmington, Connecticut and 17 CERCLA properties were located in Plainville, Connecticut. Of these properties, 26 were noted to be located within one mile of the FIP [33]. As of July 1995, 31 RCRA notifiers were located in Farmington, Connecticut and 47 RCRA notifiers were located in Plainville, Connecticut. Of these notifiers, 23 were noted to be located within one mile of the FIP [34]. Table 3 presents a summary of properties located in the FIP which are the subject of current CERCLA SIP investigations being conducted by WESTON (Figure 1B). Table 3 also provides a description of the types of potentially hazardous substances which have been disposed, used, generated, or stored on these properties.

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use/Storage	Years of Disposal	Source Areas
Dell Manufacturing Co. CTD001139336	Dell manufactures jet engine parts.	1,1,1-Trichloroethane (1,1,1-TCA) Acid etching wastewater Paint waste Waste oils Waste cooling water Waste water	1967 to March 1995 1967 to 1981 1967 to present 1967 to present 1991 to present 1967 to unknown	Unknown 1967 to 1981 Off-site disposal Off-site disposal Unknown Unknown	UST; drum storage area Drywell Drum storage area 4,000-gallon UST Drywell Septic system
Edmunds Manufacturing Co. CTD054187455	Edmunds manufactures gauges for commercial and industrial uses.	Trichloethylene (TCE) 1,1,1-TCA Untreated process rinse wastewaters Waste oil Plating wastes	1965 to unknown 1965 to unknown 1965 to 1980 1965 to unknown 1965 to 1980	1965 to unknown 1965 to unknown 1965 to 1980 1965 to unknown 1965 to 1980	Drywell; leach field Drywell; leach field 4,000-gallon UST 3,000-gallon UST UST
Fletcher-Terry Co. CTD001145309	Fletcher manufactures glass cutting tools.	Nitrating salts Waste rinsewater Waste cutting oils Grinding sludge 1,1,1-TCA	1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown	1969 to 1975 1969 to 1975 1969 to 1982 1969 to unknown 1969 to 1980	Septic system Septic system Drywell Unknown Drywell
Gros-ite Industries, Inc. CTD982543670	Gros-ite manufactures aircraft parts, machines, machine prototypes, and environmental chambers.	Waste oils Tetrachloroethylene (PCE)	1954 to 1991 1954 to 1976	1954 to 1991 1954 to 1976	3,000 and 1,000-gallon UST Leach field to ground
KIP, Inc. CTD064844426	The KIP property was initially developed by the Sureline in November of 1969. From 1969 to 1974, Sureline produced experimental and reconditioned machinery. KIP has been manufacturing solenoid valves at this location since 1983.	TCE Cutting oils and sludge BTEX	Unknown 1969 to 1988 Unknown	Unknown 1969 to 1988 Unknown	Unknown 500-gallon UST; concrete UST; drywell 500-gallon UST; concrete UST; drywell

Table 3

Summary of Substances and Source Areas Associated with Properties in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use/Storage	Years of Disposal	Source Areas
ESCO Laboratories, Inc CTD001139310	Esco, also known as Perma-Type Rubber Company manufactures rubber surgical equipment and surgical cement.	Acetone Chlorobutane Ethyl alcohol Methyl cyclohexane Methyl iso-butyl ketone Toluene Methane Butane Propane Hexane TCE 1,1,1-TCA phthalates Total Petroleum Hydrocarbons (TPH)	1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown Unknown to 1985 Unknown Unknown	1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown Unknown to 1985 Unknown Unknown	Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Rear of original building Sanitary sewer Unknown Unknown
Brown Manufacturing CTD001149038	Brown manufactures screw machine products.	1,1,1-TCA Mineral Spirits PCE Cutting Oil	1967 to 1983 1983 to 1987 1967 to 1983 1983 to 1988 1988 to present 1967 to 1983 1983 to 1988 1988 to present 1977 to unknown Unknown to present	1967 to 1983 Off-site disposal 1967 to 1983 Off-site disposal Recycled on-site 1967 to 1983 Off-site disposal Recycled on-site Off-site disposal Recycled on-site	Drywell Drum storage area Drywell Drum storage area Recycling still Drywell Drum storage area Recycling still 2,000-gallon UST Oil extractor centrifuge

Table 3

Summary of Substances and Source Areas Associated with Properties in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use/Storage	Years of Disposal	Source Areas
Whitnon-Spindle CTD052538105	Whitnon manufactures ballbearing and oil hydrostatic spindles.	Industrial waste stream (containing 1,1,1-TCA) Water soluble coolant waste Scrap metal soaked with cutting oil Waste machine oil	1955 to 1979 1979 to 1986 1979 to 1991 1991 to present Unknown to present 1955 to 1979 1979 to present 1994 to present	1955 to 1979 Off-site disposal Off-site disposal Off-site disposal Off-site disposal Unknown Off-site disposal Off-site disposal	Surface soil, drywell 1,000-gallon UST 2,000-gallon UST 2,000-gallon UST 30-yard open roll-off container Unknown Drum storage area 1,000-gallon UST
American Tool & Manufacturing Corporation CTD001148949	American Tool performs general metal machining.	Trichloroethylene TPH	1968 to 1980 Unknown	1968 to 1980 Unknown	Oil/water separator tank Septic system
Connecticut Spring and Stamping Corporation CTD001143007	CSSC manufactures coil/torsion springs and wire forms.	Acidic waste water Tumbling waste water Heat quenching waste water Tetrachloroethylene Trichloroethylene Waste oil Waste oil	1961 to 1974 1961 to 1974 1961 to 1974 1961 to present 1961 to unknown 1961 to 1972 1961 to present	1961 to 1974 1961 to 1974 1961 to 1974 Unknown 1961 to unknown Unknown Unknown	SE septic tank/leach field SE septic tank/leach field SE septic tank/leach field UST east of building UST east of building UST inside building UST northwest of building

Table 3

Summary of Substances and Source Areas Associated with Properties in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use/Storage	Years of Disposal	Source Areas
Mallory Industries, Inc. CTD001148568	Mallory manufactures cams for aircraft and other industry.	Tumbling wastewater Water soluble oils Mineral spirits Alkaline soap solution Nitric acid Phosphoric acid Waste oil Solvents Waste oil	1965 to present 1965 to present 1965 to present 1965 to present 1965 to present 1965 to present 1983 to 1995 1983 to 1992 1976 to 1983	1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 Unknown Unknown Unknown	Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Abandoned waste oil UST Abandoned waste solvent UST Removed waste oil UST
New England Aircraft Plant #1 CTD059831479	NEAP #1 manufactures jet aircraft engine blades and vanes.	Anti-rust compound Zyglo solution Fluorescent penetrant rinsewaters Metal hydroxide sludge TPH TPH TPH/waste oil Sodium chloride	1961 to present 1961 to present 1961 to present 1961 to present Unknown Unknown 1977 to present 1961 to present	1961 to 1981 1961 to 1981 1961 to 1981 1961 to 1980 Unknown Unknown Unknown Unknown	Two septic systems Two septic systems Two septic systems Eastern parking lot Loading dock area Air compressor area Waste oil ASTs ECM treatment shed
New England Aircraft Plant #2 CTD982710535	NEAP #2 manufactured jet aircraft engine parts.	Spent chromic acid (CrO_3) Waste solvents	1963 to 1976 1963 to 1976	1963 to 1976 1963 to 1976	Drywell Drywell
Roy Machinery and Sales CTD001143957	Roy performs general metal machining; paint spraying; cleaning; testing.	Unspecified industrial wastes Agitene	1957 to 1976 Unknown	1957 to 1976 Unknown	Septic system Ground west of building

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (concluded)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use/Storage	Years of Disposal	Source Areas
Mott Metallurgical Corp. CTD980524193	Mott manufacture sintered metallic filters.	1,1,1-TCA	1969 to 1975	1969 to 1975	Drywell
		MEK	1969 to 1975	1969 to 1975	Drywell
			1976 to 1981	Off-site disposal	Two, 500-gallon USTs
			1981 to present	Off-site disposal	1,000-gallon UST
		Acetone	1969 to 1975	1969 to 1975	Drywell
			1976 to 1981	Off-site disposal	Two, 500-gallon USTs
			1981 to present	Off-site disposal	Drum storage area
		Propanol	1969 to 1975	1969 to 1975	Drywell
			1976 to 1981	Off-site disposal	Two, 500-gallon USTs
			1981 to present	Off-site disposal	Drum storage area
		Waste machine oil	1979 to present	Off-site disposal	Drum storage area
		Phosphoric acid	1969 to 1975	1969 to 1975	Drywell
			1976 to 1981	Off-site disposal	Two, 500-gallon USTs
			1981 to present	Off-site disposal	1,000-gallon UST
		Nitric Acid	1969 to 1975	1969 to 1975	Drywell
			1976 to 1981	Off-site disposal	Two, 500-gallon USTs
			1981 to present	Off-site disposal	1,000-gallon UST
		Metal salts	1969 to 1975	1969 to 1975	Drywell
			1976 to 1981	Off-site disposal	Two, 500-gallon USTs
			1981 to present	Off-site disposal	1,000-gallon UST

Notes: AST = Aboveground storage tank

WASTE/SOURCE SAMPLING

There are currently nine potential source areas at the Mallory property. These include three drywells, a septic tank and associated leachfield, an abandoned 550-gallon waste oil UST and an abandoned 550-gallon waste solvent UST, a former 550-gallon UST, a drum storage area, and an area of contaminated soil [1; 4; 29; 31; 35; 36; 68].

In August 1989, NUS/FIT conducted an on-site reconnaissance and environmental sampling at the Mallory property as part of the SSI [1, p. 3]. NUS/FIT collected ten soil samples from the Mallory property, including a background soil sample, a replicate/duplicate soil sample, and a trip blank sample (Figure 2) [1, Table 3]. NUS/FIT on-site soil samples were submitted through the EPA CLP for target compound list organics and target analyte list metals [1, p. 6]. Pesticide/PCB analyses were not performed. Soil sample SS-08 was chosen as a reference sample location because it was not associated with any sources at the property, and was collected from an area which was apparently undisturbed by Mallory operations. Table 4 summarizes NUS/FIT source samples collected on the Mallory property [1, p. 7, Table 3].

Table 4

Source Sample Summary: Mallory Industries, Inc., Samples Collected by NUS/FIT on August 14, 1989

Sample Location No.	Traffic Report No.	Remarks	Sample Source
MATRIX: SOIL			
SS-01	AQ204 MAL951	Grab (4.0 feet)	Soil sample collected 70 feet from the southeast corner of the manufacturing building. Approximate drywell location.
SS-01R/D	AQ205 MAL952	Grab (4.0 feet)	Replicate/duplicate (R/D) of soil sample SS-01.
SS-02	AQ206 MAL953	Grab (3.0 feet)	Soil sample collected 80 feet from the southeast corner of the manufacturing building. Approximate leachfield location.
SS-03	AQ207 MAL954	Grab (3.0 feet)	Soil sample collected 72 feet from the southeast corner of the manufacturing building. Approximate leachfield location.
SS-04	AQ208 MAL955	Grab (2.0 feet)	Soil sample collected 70 feet from SS-03. Approximate leachfield location.
SS-05	AQ209 MAL956	Grab (2.0 feet)	Soil sample collected in the vicinity of the on-site drywells, 65 feet from the southwest corner of the manufacturing building.
SS-06	AQ210 MAL957	Grab (2.0 feet)	Soil sample collected in the vicinity of the on-site drywells, 115 feet from the southwest corner of the manufacturing building.

Table 4

Source Sample Summary: Mallory Industries, Inc., Samples Collected by NUS/FIT on August 14, 1989 (concluded)

Sample Location No.	Traffic Report No.	Remarks	Sample Source
SS-07	AQ211 MAL958	Grab (2.0 feet)	Soil sample collected in the vicinity of the USTs, 50 feet from the southwest corner of the manufacturing building.
SS-08	AQ212 MAL959	Grab (2.0 feet)	Reference soil sample collected 150 feet from the southwest corner of the manufacturing building.
SS-09	AQ213	Grab	Soil blank sample collected for quality control.

Table 5 is a summary of organic compounds and inorganic elements detected through CLP analyses of NUS/FIT source samples [1]. For each sample location, a compound or element is listed if it was detected at three times or greater than the reference sample concentration (SS-08). However, if the compound or element was not detected in the reference sample, the reference sample's quantitation limit (SQL) (for organic analyses) or detection limit (SDL) (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 5

Summary of Analytical Results, Source Sample Analysis for Mallory Industries, Inc.: Samples Collected by NUS/FIT on August 14, 1989

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SS-01 (AQ204) (MAL951)	**INORGANICS**			
	Beryllium	0.97 J mg/kg	0.3 J mg/kg	3.2 × REF
SS-01R/D (AQ205) (MAL952)	**INORGANICS**			
	Beryllium	0.93 J mg/kg	0.3 J mg/kg	3.1 × REF
SS-02 (AQ206) (MAL953)	**INORGANICS**			
	Beryllium	0.91 J mg/kg	0.3 J mg/kg	3.0 × REF

Table 5

Summary of Analytical Results, Source Sample Analysis for Mallory Industries, Inc.: Samples Collected by NUS/FIT on August 14, 1989 (continued)

Sample Location	Compound/Element	Sample Concentration		Reference Concentration		Comments
SS-03 (AQ207) (MAL954)	**INORGANICS**					
	Aluminum	15,000	mg/kg	4,080	mg/kg	3.7 × REF
	Barium	48.1	mg/kg	0.7	U mg/kg	68.7 × SDL
	Beryllium	0.92	J mg/kg	0.3	J mg/kg	3.1 × REF
SS-04 (AQ208) (MAL955)	**INORGANICS**					
	Aluminum	16,000	mg/kg	4,080	mg/kg	3.9 × REF
	Barium	55.5	mg/kg	0.7	U mg/kg	79.3 × SDL
	Beryllium	0.92	J mg/kg	0.3	J mg/kg	3.1 × REF
	Lead	9.4	mg/kg	2.7	mg/kg	3.5 × REF
SS-05 (AQ209) (MAL956)	**INORGANICS**					
	Aluminum	13,100	mg/kg	4,080	mg/kg	3.2 × REF
	Barium	42.1	mg/kg	0.7	U mg/kg	60.1 × SDL
	Beryllium	0.94	J mg/kg	0.3	J mg/kg	3.1 × REF
	Lead	8.5	mg/kg	2.7	mg/kg	3.1 × REF
SS-06 (AQ210) (MAL957)	**INORGANICS**					
	Aluminum	18,200	mg/kg	4,080	mg/kg	4.5 × REF
	Barium	49.9	mg/kg	0.7	U mg/kg	71.3 × SDL
	Beryllium	1.0	J mg/kg	0.3	J mg/kg	3.3 × REF
	Chromium	16.2	J mg/kg	5.4	J mg/kg	3.0 × REF
	Lead	9.1	mg/kg	2.7	mg/kg	3.4 × REF
	Zinc	35.4	J mg/kg	10.2	J mg/kg	3.5 × REF

Table 5

Summary of Analytical Results, Source Sample Analysis for Mallory Industries, Inc.: Samples Collected by NUS/FIT on August 14, 1989 (concluded)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SS-07 (AQ211) (MAL958)	**SVOCS**			
	Fluoranthene	2,400 µg/kg	730 U µg/kg	3.3 × SQL
	INORGANICS			
	Barium	50.3 mg/kg	0.7 U mg/kg	71.9 × SDL
	Beryllium	0.93 J mg/kg	0.3 J mg/kg	3.1 × REF
	Lead	12.1 mg/kg	2.7 mg/kg	4.5 × REF
	Zinc	30.7 J mg/kg	10.2 J mg/kg	3.0 × REF

µg/kg = Micrograms per kilogram.
mg/kg = Milligrams per kilogram.
U = Substance not detected in reference sample.
J = The associated numerical value is an estimated quantity.
REF = Reference value.

No VOCs were detected in the NUS/FIT on-site source soil samples collected on August 14, 1989. However, one SVOC, fluoranthene (2,400 µg/kg), was detected in soil sample SS-07 collected in the vicinity of the USTs southwest of the manufacturing building (Figure 2) [1, Table 3]. In addition, the following inorganic elements were detected; aluminum, barium, beryllium, chromium, lead, and zinc ranging in concentrations from 0.91 to 18,200 mg/kg [1, Attachments D and E]. Several values associated with the inorganic elements detected in NUS/FIT on-site soil samples were estimated or J'd. The detection of these substances has been included to remain consistent with technical directives provided by EPA Region I. The complete analytical results for the 1989 NUS/FIT sampling are included in Attachment A.

In addition to the 1989 NUS/FIT on-site samples, three soil samples were collected by CT DEP on August 14, 1989; the exact locations where CT DEP collected the soil samples could not be determined from available file information [1]. CT DEP soil samples were analyzed for hydrocarbons and chlorinated solvents; however, the exact analytical method used is not known. No substances were detected in the 1989 CT DEP on-site soil samples. The complete analytical results of the CT DEP 1989 sampling are included in Attachment B.

On December 22, 1994, CT DEP conducted additional on-site soil sampling to evaluate conditions at the Mallory property [29]. CT DEP collected one soil sample (M-1) from the bottom of the drywell located along the northeast side of the manufacturing building [29]. The

exact analytical method used to analyze the drywell soil sample is not known. In addition, it is not known if a background, replicate/duplicate sample, or a trip blank sample was collected. Table 6 is a summary of substances detected in the CT DEP drywell sample [29]. Substances are listed on Table 6 if their concentrations exceed corresponding detection limits.

Table 6

Summary of Analytical Results,
Source Sample Analysis for Mallory Industries, Inc.
Sample Collected by CT DEP on December 22, 1994

Compound	Concentration (μg/kg)	Detection Limit (μg/kg)	Comments
Acetone	380	16.1	23.6 × DL
trans-1,2-Dichloroethylene	4.5	0.57	7.9 × DL
cis-1,2-Dichloroethylene	350	0.54	648.1 × DL
Benzene	310	0.38	815.8 × DL
Trichloroethylene	2.5	0.44	5.7 × DL
Toluene	120	0.38	315.8 × DL
Tetrachloroethylene	17	0.44	38.6 × DL
Ethyl benzene	15	0.44	34.1 × DL
m,p-Xylene	96	0.84	114.3 × DL
o-Xylene	75	0.53	141.5 × DL
Cumene	12	0.51	23.5 × DL
n-Propyl benzene	22	0.44	50.0 × DL
1,3,5-Trimethylbenzene	32	0.39	82.1 × DL
1,2,4-Trimethylbenzene	310	0.57	543.9 × DL
p-Isopropyltoluene	96	0.40	240.0 × DL
Naphthalene	25	0.44	56.8 × DL

DL = Detection Limit.

Laboratory results indicate that 16 organic substances were detected in the CT DEP soil sample ranging in concentrations from 4.5 μg/kg (trans-1,2-dichloroethylene) to 380 μg/kg (acetone). The substances detected in the drywell are consistent with past waste disposal practices at Mallory. The complete analytical results of the CT DEP 1994 sampling are included in Attachment C. No other known soil samples have been collected at the Mallory property which characterize potential source areas.

GROUNDWATER PATHWAY

Prior to 1965, the Mallory property was used as farmland [1, p. 2]. Soil maps for Hartford County report the soil type at the Mallory property as Manchester Gravelly Loam [37]. Surficial geology of the area beneath the Mallory property has been mapped as glacial collapsed stratified drift deposits [39]. These deposits are associated with deltaic deposits comprised of stratified sand and gravel, overlying glacial till. The occurrence of sand and gravel in the deposits indicate that the overburden permeability at the property is moderate to high [1, p. 6; 8]. The underlying glacial till is presumed to be present continuously beneath sand and gravel throughout the Pequabuck River Valley within a two-mile radius of the property, based on its occurrence in all of the boring logs for monitoring wells installed in the vicinity of Scott Swamp Brook and the Pequabuck River [18, Appendix 1].

Bedrock geology beneath the Mallory property has been mapped as the Triassic New Haven Arkose, which makes up a large part of the Central Lowlands of Connecticut. The New Haven Arkose is a reddish, poorly-sorted sandstone and conglomerate. This central region of Connecticut contains several large fault zones that strike approximately North 50° East, with dip angles near vertical [41]. An inactive private groundwater production well, located approximately 2,750 feet southeast of the Mallory property, is completed in bedrock at a depth of approximately 165 feet below ground surface (bgs). The well was noted to exist under flowing artesian conditions (with a potentiometric surface above the ground surface) by WESTON personnel on April 17, 1995 [42]. The top of the overburden water table at this location is approximately 30 feet bgs [42]. These observations indicate that the potentiometric surface in the bedrock is greater than that in the overburden by at least 30 feet. Therefore, any groundwater flow between the two units would tend to be from the higher potentiometric surface to the lower, in this case, from bedrock to overburden [43, pp. 21, 48-49].

Overburden becomes much thicker, approximately 0.31 miles east of the Mallory property where a glaciolacustrine varved silt and clay unit, between 86 and 205 feet thick and one mile wide, occurs within the overburden. This layer partially separates unconfined and confined portions of the Pequabuck River Valley overburden aquifer [40]. Although the silt and clay layer strongly restricts groundwater flow between the two parts of the overburden aquifer, aquifer tests have demonstrated interconnection between the unconfined and confined parts of the overburden aquifer, in particular in the stratified drift deposits located north and west of the FIP and Johnson Avenue wells [40]. The Mallory property is located above stratified drift deposits northwest of these wells, in an area noted to be a recharge area for the lower portion of the Pequabuck River Valley overburden aquifer [40]. Further, since the silt and clay layer may not be present beneath the Mallory property, the silt and clay layer does not meet the CERCLA definition of a confining layer [40; 44].

Typical hydraulic conductivities for sand and gravel range from 10^{-4} to 10^{-2} centimeters per second (cm/s), typical hydraulic conductivities for glacial till range from 10^{-6} to 10^{-4}, and typical hydraulic conductivities for fractured sedimentary rock are approximately 10^{-4} cm/s [43]. For the purposes of this report, the glacial till which underlies the Pequabuck River Valley overburden aquifer is considered to constitute a continuous, low-permeability layer which separates overburden and bedrock aquifers beneath the property and throughout the aquifer [43]. Further, the observed hydraulic gradient between the overburden and bedrock aquifers in the vicinity of

the FIP indicates that any groundwater flow between the two aquifers would be from bedrock to overburden [41]. While it is possible that contaminant flow from the overburden to the bedrock aquifer may occur under the overall groundwater flow regime if dense non-aqueous phase liquid is present, existing hydrogeological data, as well as analytical data support an aquifer discontinuity [41; 42].

The Pequabuck River Valley overburden aquifer, in the vicinity of Scott Swamp Brook, is bordered to the west by collapsed stratified drift, kame, and glacial till deposits, to the east by bedrock outcrops. The Pequabuck River Valley overburden aquifer begins at the Quinnipiac River Valley in the south, and terminates beneath the Farmington River in Avon, Connecticut [39]. During the pumping of the public water supply wells located southeast of the Mallory property, the direction of groundwater flow within the Pequabuck River Valley overburden aquifer was determined to flow radially toward these wells. Based on previous groundwater data and the topography surrounding the Mallory property, the direction of groundwater flow is assumed to be towards the east [40, Figure 9]. Average annual rainfall for the Town of Farmington is 49.06 inches per year [38].

All or part of the following Connecticut cities and towns are located within four radial miles of the FIP properties: Bristol (population 60,640), Burlington (population 7,026), New Britain (population 72,513), Farmington (population 20,608), Plainville (population 17,197), and Southington (population 38,000) [10; 23; 24; 45; 53; 55].

The Bristol Water Department (BWD) of the Town of Bristol operates two separate public water supplies. One is located in the western part of the town, and relies on combined groundwater and surface water sources located more than four-radial miles and 15-downstream miles from the property [8; 11]. The second supply is located in the northeastern part of the town and serves 20,000 persons. The supply obtains water from four wells located within four miles of the property. BWD Well No. 2 is drilled in overburden 75 feet deep and is located approximately 2.28 miles southwest of the property, and supplies 50 percent of the total supply [8; 11]. The other 50 percent of the supply (no further breakdown is available) is obtained from the three Mix Street Wells, which are overburden wells, 55 feet deep, and are located approximately 2.58 miles west of the property [8; 11]. For the purposes of this report, the three Mix Street Wells are assumed to contribute equally to the system, and each serve 3,334 persons [46]. The remainder of the population of Bristol is presumed to rely on private drinking water wells and groundwater sources from outside of the four-mile radius to the property.

A small section of the southeast corner of the Town of Burlington is located within the four-mile radius. No major public water supplies have been identified in this area; however there are two community water supplies in that area of Burlington: the Farmington Line West Condominium Well, 2.68 miles northwest of the property, as well as, the Woodcrest Association Well, which is 2.78 miles northwest of the property. The wells serve 34 and 60 persons, respectively; no data regarding depth is available [9; 13; 45; 47]. Much of the Town of Burlington relies on private wells.

Four public water supplies provide drinking water to most of the residents of Farmington [14]. The New Britain Water Department (NBWD) supplies water to an estimated 90,677 persons, including residents of Farmington, Kensington, New Britain, Newington, and Plainville,

Connecticut. The supply is provided from seven groundwater wells and six reservoirs which are not located downstream of the FIP properties [8; 24]. One pair of overburden groundwater wells, known as the White Bridge wells and operated by the NBWD, are located approximately 2.18 miles west of the property [24; 45]. The White Bridge wells provide 28.6 percent of the total annual water supply for NBWD, and serve 25,900 persons.

The Metropolitan District Commission supplies water to some residents of Farmington, as well as, other communities in the greater Hartford area. The supply is provided from reservoirs which are not located downstream of the FIP properties [8; 14].

The Plainville Water Company (PWC) provides drinking water to residents of Farmington and Plainville. The PWC maintains a blended system of five overburden wells which serves a total of 20,000 people. Prior to distribution, water from these wells is air-stripped. The two PWC overburden wells located between 0.53 and 0.50 miles southeast of the property are known as the Johnson Avenue Wells and account for 27.4 percent of the system's annual total water supply, and serve an estimated 5,480 persons [45]. These wells are screened in the lower portion of the Pequabuck River Valley overburden aquifer, at depths of 80 to 93 and 92 to 110 feet bgs, respectively [39]. The three PWC wells located 2.33 miles southeast of the property are known as the Woodford Avenue Wells and supply 72.6 percent of the system's annual total water supply, serving an estimated 14,520 persons [8; 18; 45; 49; 52]. These wells are also screened in the Pequabuck River Valley overburden aquifer, at a point up-gradient of the FIP area [8; 39].

The UWC provides drinking water to many residents in Farmington. The UWC system consists of eight wells at four locations in Farmington. Of these eight wells, all of the five Charles House Wells are located outside four miles of the Mallory property. None of these wells are completed in the Pequabuck River Valley overburden aquifer, although the Wells Acres Well, which is screened in bedrock, is located only 0.28 miles northwest of the Mallory property [8]. The Wells Acres Well was sampled by WESTON on July 12, 1995. The UWC also maintains four wells which provide water to the FIP; named FIP Nos. 1-4. Available information suggests that this water is used for both manufacturing processes and potable purposes at the FIP. Several businesses in the FIP use bottled drinking water. The wells serve an estimated 1,026 workers at businesses within the FIP [25]. The wells are located immediately southeast of the FIP (Figure 1B) [8; 17; 45]. The annual contribution of each well to the system is based on 1994 annual production figures [19; 45]. All four of the wells are screened in the lower portion of the Scott Swamp Brook Valley overburden aquifer [39]. The UWC also maintains the Connecticut Sand & Stone Well located in Farmington, 2.88 miles northeast of the property which serves an estimated 2,792 persons.

The NBWD supplies water to some residents of New Britain, as well as Farmington, Kensington, Newington, and Plainville, Connecticut. The supply is provided from six reservoirs which are not located downstream of the FIP properties [8; 49].

Most of Plainville is provided drinking water by the PWC and the NBWD. The Cope Manor rest home maintains a bedrock well which provides drinking water to an estimated 92 patients and staff and is located approximately 1.42 miles southwest of the property [9; 20; 48]. Ciccio Court Apartments, located approximately 3.30 miles south of the property, also maintains a well in Plainville serving an estimated 80 people [8; 9].

One community water supply is located approximately 3.60 miles south of the property at Apple Valley Village Apartments, serving an estimated 70 people [8]. Table 7 summarizes public groundwater supply sources located within four radial miles of the Mallory property [8; 9; 10; 11; 12; 13; 14; 17; 18; 19; 20; 26; 46; 47; 48; 49; 51].

Table 7

Public Groundwater Supply Sources within Four Radial Miles of Mallory Industries, Inc.

Distance/ Direction from Site	Source Name	Location of Source	Estimated Population Served	Source Type
0.28 Miles Northwest	UWC Wells Acres	Farmington	457	1 bedrock well
0.43 Miles Southeast	FIP Well No. 4	Plainville	477	1 overburden well
0.45 Miles Southeast	FIP Well No. 3	Plainville	547	1 overburden well
0.46 Miles Southeast	FIP Well No. 1	Farmington	2	1 overburden well
0.51 Miles Southeast	PWC Johnson Avenue Well No. 6	Plainville	2,740	1 overburden well
0.52 Miles Southeast	FIP Well No. 2	Farmington	0	1 overburden well
0.53 Miles Southeast	PWC Johnson Avenue Well No. 3	Plainville	2,740	1 overburden well
1.42 Miles Southeast	Cope Manor	Plainville	92	1 bedrock well
2.18 Miles West	NBWD White Bridge Wells	Bristol	25,900	2 overburden wells
2.28 Miles Southwest	BWD Well No. 2	Bristol	10,000	1 overburden well
2.33 Miles Southeast	PWC Woodford Avenue Wells	Plainville	14,520	3 overburden wells
2.58 Miles West	BWD Mix Street Wells	Bristol	10,000	3 overburden wells
2.68 Miles Northwest	Farmington Line West Condominium	Burlington	34	Unknown
2.68 Miles Northwest	UWC Pondwood Well	Farmington	406	1 bedrock well
2.78 Miles Northwest	Woodcrest Association	Burlington	60	Unknown
2.88 Miles Northeast	UWC CT Sand & Stone Well	Farmington	2,792	1 overburden well
3.30 Miles South	Ciccio Court	Plainville	80	Unknown
3.60 Miles South	Apple Valley Village	Southington	70	Unknown

The nearest verified private well is located approximately 1.2 miles northwest of the Mallory property (Figure 1A) [2; 53]. The number of persons who rely on private groundwater supplies within a four-mile radius of the FIP was reported by CENTRACTS which estimates groundwater populations using equal distribution calculations of U.S. Census data identifying population, households and private water wells for "Block Groups" which lie wholly or in part within individual radial distance rings measured from potential sources on the Mallory property [6]. Because the CENTRACTS report estimates private well use in each block and no private wells have been identified less than one mile from the property, the population attributed to the 0 to 0.25, the 0.25 to 0.5, and the 0.5 to 1.0 mile rings in the CENTRACTS report has been shifted to the 1.0 to 2.0-mile distance ring. Table 8 summarizes the public and private well users within four miles of the Mallory property [6; 46].

Table 8

Estimated Drinking Water Populations Served by Groundwater Sources within Four Radial Miles of Mallory Industries, Inc.

Radial Distance from Mallory (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources within the Ring
0.00 < 0.25	0	0	0
0.25 < 0.50	0	1,483	1,483
0.50 < 1.00	0	5,480	5,480
1.00 < 2.00	1,396	92	1,488
2.00 < 3.00	2,839	63,712	66,551
3.00 < 4.00	3,654	150	3,804
TOTAL	**7,889**	**70,917**	**78,806**

According to state file information, The Connecticut Department of Health Services (CT DHS) initially collected and analyzed samples from the four FIP wells and Johnson Avenue Well No. 3 in June 1975. Available records indicate that the Johnson Avenue Well No. 6 was first sampled in June 1982.

Analytical results from the June 1975 sampling round of the four FIP wells and Johnson Avenue Well No. 3 indicated the presence of several VOCs at concentrations ranging from 20 to 1,000 parts per billion (ppb). The compounds present at the highest concentrations from the June 1975 sampling round included 1,1,1-TCA at 1,000 ppb, chloroform at 680 PCE at 640 ppb, and TCE at 430 ppb. The highest concentrations of TCA, TCE, and chloroform were noted in samples collected from Johnson Avenue Well No. 3, and the highest concentration of PCE was detected in the sample collected from FIP Well No. 4.

Samples have been collected from the six affected wells intermittently from 1975 to the present, with the exception of Johnson Avenue Well No. 6, for which no analytical results are available prior to 1982 [1]. A summary of these analytical results, through 1989, is included in Attachment D.

The concentration of chlorinated organics in the wells has generally decreased since their discovery in 1975, but were still present as of the latest sampling round conducted in, Spring 1995 [1; 46; 52]. The most recent analytical results available for the FIP wells and the Johnson Avenue wells are included in Attachment E.

Table 9 summarizes the results of sampling of the FIP and Johnson Avenue wells. The first data column notes the highest concentration of the substance and the sampling date. The second data column records the concentration of the same substance as detected in the most recent sampling event, in order to illustrate the trend of contamination.

Table 9

Summary of Substances Detected in Drinking Water Wells in the Vicinity of the Farmington Industrial Park

Well	Substance	Highest Concentration/Date (ppb)	Most Recent Concentration/Date (ppb)	EPA MCL (ppb)
FIP No. 1	Chloroform	20 6/2/75	NS	---
	1,1,1-TCA	ND	NS	200
	TCE	200 6/2/75	NS	5
	PCE	ND	NS	5
FIP No. 2	Chloroform	60 6/2/75	NS	---
	1,1,1-TCA	ND	NS	200
	TCE	85 6/2/75	NS	5
	PCE	160 6/2/75	NS	5
FIP No. 3	Chloroform	97 6/2/75	ND 1/11/95	---
	1,1,1-TCA	46 * 3/20/80	4.1 1/11/95	200
	TCE	36 6/2/75	0.86 1/11/95	5
	PCE	73 6/2/75	1.2 1/11/95	5
FIP No. 4	Chloroform	77 6/2/75	ND 10/28/94	---
	1,1,1-TCA	25 * 2/29/80	4.9 10/28/94	200
	TCE	53 6/2/75	0.95 10/28/94	5
	PCE	640 6/2/75	1.5 10/28/94	5

Table 9

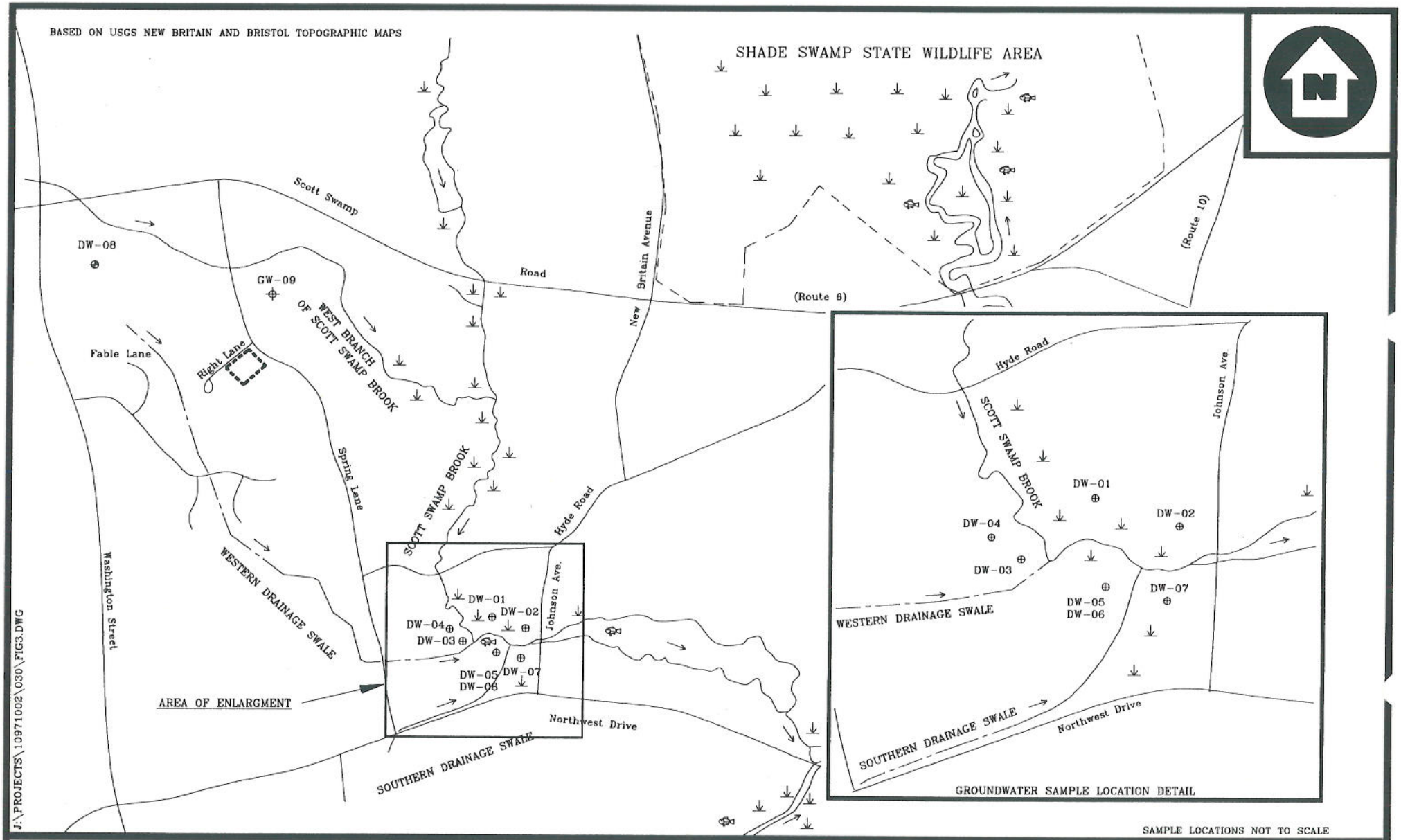
Summary of Substances Detected in Drinking Water Wells in the Vicinity of the Farmington Industrial Park (concluded)

Well	Substance	Highest Concentration/Date (ppb)		Most Recent Concentration/Date (ppb)		EPA MCL (ppb)
Johnson Avenue Well No. 3	Chloroform	680	6/2/75	ND	1/17/95	---
	1,1,1-TCA	1,000	6/20/75	19.7	1/17/95	200
	TCE	900	7/22/75	4.9	1/17/95	5
	PCE	60	6/2/75	14.0	1/17/95	5
Johnson Avenue Well No. 6	Chloroform	ND		ND	1/17/95	---
	1,1,1-TCA	12.8	4/19/88	3.5	1/17/95	200
	TCE	34.8	9/6/88	21.0	1/17/95	5
	PCE	5.8	12/22/86	3.1	1/17/95	5

EPA MCL = EPA Maximum Contaminant Level.
ND = Not Detected.
NS = Not Sampled.
--- = No Value Listed.
* = A higher concentration of 1,1,1-TCA, 101 ppb, was detected in a composite sample of water from FIP Well Nos. 3 and 4 on October 3, 1983.

On July 12, 1995, WESTON collected eleven groundwater and drinking water samples from one monitoring well and eight public supply wells in the vicinity of the FIP (Figure 3), including a reference groundwater sample (GW-09), replicate/duplicate samples (GW-03/04), a rinsate blank sample (RB-02), and a trip blank sample (TB-01). Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory [53, pp. 39-40].

Groundwater sample GW-09 was selected as a reference sample because it was collected from monitoring well MW-1 on the New England Aircraft Plant No. 1 property, which is located upgradient of potential sources of groundwater contamination identified within the vicinity of the FIP, including the New England Aircraft Plant No. 1 property [54]. None of the groundwater or drinking water samples collected by WESTON were filtered prior to collection.



GROUNDWATER SAMPLE LOCATION MAP

MALLORY INDUSTRIES, INC.
FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3

Table 10 summarizes groundwater and drinking water samples collected during the WESTON FIP sampling event [53, pp. 39-40].

Table 10

Groundwater and Drinking Water Sample Summary: Mallory Industries, Inc., Samples Collected by WESTON on July 12, 1995

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: AQUEOUS				
DW-01	DAR73 AHF21 MAGL38	1015	Grab	Drinking water sample collected from FIP Well No. 1.
DW-02	DAR74 AHF22 MAGL39	1115	Grab	Drinking water sample collected from FIP Well No. 2.
DW-03	DAR75 AHF23 MAGL40	0945	Grab	Drinking water sample collected from FIP Well No. 3.
DW-04	DAR76 AHF24 MAGL41	1005	Grab	Drinking water sample collected from FIP Well No. 4.
DW-05	DAR77 AHF25 MAGL42	1400	Grab	Drinking water sample collected from PWC Johnson Avenue Well No. 6.
DW-06	DAR78 AHF26 MAGL43	1400	Grab	Duplicate of sample DW-05 collected for quality control.
DW-07	DAR79 AHF27 MAGL44	1415	Grab	Drinking water sample collected from PWC Johnson Avenue Well No. 3.
DW-08	DAR80 AHF28 MAGL45	0915	Grab	Drinking water sample collected from the UWC Wells Acres Well.
GW-09	DAR81 AHF29 MAGL46	1255	Grab	Groundwater sample collected from monitoring well MW-01 on the New England Aircraft Plant No. 1 property, as a reference sample.
TB-02	DAR83	0855	Grab	Trip Blank sample collected for quality control.
RB-02	DAR82 AHF33 MAGL50	0900	Grab	Rinsate Blank sample collected for quality control.

Table 11 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON drinking water samples [15]. For each sample location, a compound or element is listed if it was detected at three times or greater than the reference sample's concentration (GW-09). However, if the compound or element was not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 11

Summary of Analytical Results,
Drinking Water Sample Analysis for Mallory Industries, Inc.:
Samples Collected by WESTON on July 12, 1995

Sample Location	Compound/Element	Concentration	Reference Concentration	Comments
DW-01 (DAR73) (AHF21) (MAGL38)	**VOCS**			
	1,1,1-TCA	31 µg/L	2 U µg/L	15.50 × SQL
	TCE	4.2 µg/L	2 U µg/L	2.10 × SQL
	SVOCS			
	Naphthalene	2.4 µg/L	2 U µg/L	1.20 × SQL
DW-02 (DAR74) (AHF22) (MAGL39)	**VOCS**			
	1,1-DCE	2.1 µg/L	2 U µg/L	1.05 × SQL
	1,1,1-TCA	16 µg/L	2 U µg/L	8.00 × SQL
	TCE	4.9 µg/L	2 U µg/L	2.45 × SQL
	cis-1,2-DCE	6.6 µg/L	2 U µg/L	3.30 × SQL
	PCE	25 µg/L *	2 U µg/L	12.50 × SQL
DW-03 (DAR75) (AHF23) (MAGL40)	**VOCS**			
	1,1,1-TCA	4.9 µg/L	2 U µg/L	2.45 × SQL
DW-04 (DAR76) (AHF24) (MAGL41)	**VOCS**			
	cis-1,2-DCE	10 µg/L	2 U µg/L	5.00 × SQL
	PCE	2.7 µg/L	2 U µg/L	1.35 × SQL

Table 11

Summary of Analytical Results, Drinking Water Sample Analysis for Mallory Industries, Inc.: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location	Compound/Element	Concentration	Reference Concentration	Comments
DW-05 (DAR77) (AHF25) (MAGL42)	**VOCS**			
	TCE	13 µg/L *	2 U µg/L	6.50 × SQL
	cis-1,2-DCE	5.6 µg/L	2 U µg/L	2.80 × SQL
	1,2,3-Trichlorobenzene	2 µg/L	2 U µg/L	1.00 × SQL
	SVOCS			
	Naphthalene	4.3 µg/L	2 U µg/L	2.15 × SQL
DW-06 (DAR78) (AHF26) (MAGL43)	**VOCS**			
	TCE	13 µg/L *	2 U µg/L	6.50 × SQL
	cis-1,2-DCE	5.6 µg/L	2 U µg/L	2.80 × SQL
DW-07 (DAR79) (AHF27) (MAGL44)	**VOCS**			
	1,1,1-TCA	10 µg/L	2 U µg/L	5.00 × SQL
	TCE	2.7 µg/L	2 U µg/L	1.35 × SQL
	cis-1,2-DCE	2.3 µg/L	2 U µg/L	1.15 × SQL
	PCE	7.4 µg/L *	2 U µg/L	3.70 × SQL

U = The compound was analyzed for; but, was not detected. The associated numerical value is the sample quantitation limit.
* = Concentration exceeds the MCL.
1,1-DCE = 1,1-Dichloroethylene
cis-1,2-DCE = cis-1,2-Dichloroethylene

Several VOCs were detected at elevated concentrations in drinking water samples submitted for analysis; sample concentrations ranged from 1.0 to 15.5 times the SQL. The following VOCs were detected at concentrations that exceed current MCLs; PCE at 25 and 7.4 µg/L in DW-02 and DW-07, respectively and TCE at 13 µg/L in DW-05 and DW-06. The EPA MCL for PCE is 5 µg/L. The concentrations of PCE detected in drinking water samples DW-02 and DW-07 are 5.0 and 1.5 times the MCL, respectively. The MCL for TCE is 5 µg/L. The concentration of TCE detected in drinking water samples DW-05 and DW-06 is 2.6 times the MCL in both samples.

The SVOC naphthalene was also detected between 1.2 and 2.15 times the SQL. Naphthalene is a component of petroleum fractions and may be considered a constituent of waste oils, cutting oils, and lubricating oils. No pesticide/PCB or inorganic elements were detected in any of the WESTON drinking water samples collected to evaluate the property. The complete analytical results of the 1995 WESTON sampling event are included in Attachment F.

Comparisons can be drawn between historical drinking water analytical results and the more recent analytical results to determine trends of contamination. The following is a description of analytical concentrations for certain contaminants detected in the FIP and Johnson Avenue Wells, including the date of a contaminant's highest concentration in a particular well and current status of the well with respect to the contaminant.

Chloroform

The highest concentration of chloroform in FIP Well No. 1 was detected at 20 μg/L on June 2, 1975. Analytical results from the WESTON sampling event, conducted on July 12, 1995, indicated that chloroform was not present above the detection limits in this well [15; 50; 55].

The highest concentration of chloroform in FIP Well No. 3 was detected at 97 μg/L on June 2, 1975. Analytical results from January 11, 1995, indicate that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event also indicated a non-detectable value of chloroform in FIP Well No. 3 [15; 50].

The highest concentration of chloroform in FIP Well No. 4 was detected at 77 μg/L on June 2, 1975. Analytical results from October 28, 1994, indicated that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event also indicate a non-detectable value of chloroform in FIP Well No. 4 [15; 50; 55].

The highest concentration of chloroform in Johnson Avenue Well No. 3 was detected at 680 μg/L on June 2, 1975. Analytical results from January 17, 1995, indicate that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event, on July 12, 1995, also indicate a non-detectable value of chloroform in Johnson Avenue Well No 3. Chloroform has never been detected above detection limits in Johnson Avenue Well No. 6 [15; 50; 55].

Based on the analytical results, it appears that the presence of chloroform in the FIP and Johnson Avenue Wells may have been an isolated incident. Chloroform does not appear to be a continuing source of contamination in the FIP and Johnson Avenue Wells. Based on operational records provided by Mallory and prior analytical data from on-site soil samples collected by NUS/FIT and CT DEP, chloroform is not considered attributable to Mallory for the purposes of this SIP.

1,1,1-Trichloroethane

Prior to the WESTON sampling event on July 12, 1995, 1,1,1-TCA had never been detected in FIP Well Nos. 1 or 2. However, analytical results from the WESTON sampling event indicated that 1,1,1-TCA is present in FIP Well No. 1 at 31 μg/L and FIP Well No. 2 at 16 μg/L [15; 50].

The highest concentration of 1,1,1-TCA in FIP Well No. 3 was detected at 46 µg/L on March 20, 1980. On January 11, 1995, the concentration of 1,1,1-TCA had diminished to 4.1 µg/L. The WESTON sampling event revealed that the 1,1,1-TCA concentration has slightly increased from the January 11, 1995 to 4.9 µg/L in FIP Well No. 3 [15; 50; 55].

The highest concentration of 1,1,1-TCA in FIP Well No. 4 was detected at 25 µg/L on February 29, 1980. On October 28, 1994, the concentration of 1,1,1-TCA had decreased to 4.9 µg/L. The WESTON sampling event indicated that the 1,1,1-TCA concentration had diminished below detectable limits in FIP Well No. 4 [15; 50; 55].

The highest concentration of 1,1,1-TCA in Johnson Avenue Well No. 3 was detected at 1,000 µg/L on June 20, 1975. This concentration exceeds the 1,1,1-TCA MCL (established at 200 µg/L) by five times. A January 17, 1995 sampling event indicated that this concentration had decreased to 19.7 µg/L, substantially below the MCL. A 1,1,1-TCA concentration of 10 µg/L was detected in Johnson Avenue Well No. 3 by WESTON during the July 12, 1995, sampling event [15; 50; 55].

The highest concentration of 1,1,1-TCA in Johnson Avenue Well No. 6 was detected at 12.8 µg/L on April 19, 1988. A January 17, 1995 sampling event indicated that this concentration had decreased to 3.5 µg/L. The WESTON sampling event indicated that the 1,1,1-TCA concentration had diminished below detectable limits in Johnson Avenue Well No. 6 [15; 50; 55].

Based on the analytical results, it appears that the presence of 1,1,1-TCA in FIP Wells No. 1 and 2 may be the result of an accumulation of the contaminant in the overburden material, despite a 15-minute purge period prior to sample collection. These two wells are used for back-up purposes and, at the time of sample collection on July 12, 1995, had not been pumping for several weeks [15; 50; 55].

The concentrations of 1,1,1-TCA in the wells have illustrated steady declines over time, with the exception of FIP Well No. 3, which displayed a slightly elevated concentration. Based on operational records provided by Mallory and prior on-site soil source samples collected by CT DEP and NUS/FIT, 1,1,1-TCA will not be considered attributable to Mallory for the purposes of this SIP. 1,1,1-TCA may degrade in soils and groundwater to 1,1-DCE, 1,1-DCA, cis-1,2-DCE, chloroethane, vinyl chloride, and acetic acid [66; 67].

Trichloroethylene

The highest concentration of TCE in FIP Well No. 1 was detected at 200 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE (established at 5 µg/L) by 40 times. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 1 has diminished to 4.2 µg/L [15]. The highest concentration of TCE in FIP Well No. 2 was detected at 85 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE by 17 times. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 2 has diminished to 4.9 µg/L [15; 50; 55].

The highest concentration of TCE in FIP Well No. 3 was detected at 36 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE by more than seven times. On January 11, 1995,

the concentration of TCE was detected at 0.86 μg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 3 has further diminished to below detectable levels [15; 50; 55].

The highest concentration of TCE in FIP Well No. 4 was detected at 53 μg/L on June 2, 1975. This concentration exceeds the MCL for TCE by more than ten times. On October 28, 1994, the concentration of TCE was detected at 0.95 μg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 4 has further diminished to below detectable levels [15; 50; 55].

The highest concentration of TCE in Johnson Avenue Well No. 3 was detected at 900 μg/L on July 22, 1975. This concentration exceeds the MCL for TCE by 180 times. On January 17, 1995 the concentration of TCE was detected at 4.9 μg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in Johnson Avenue Well No. 3 has further diminished to 2.7 μg/L [15; 50; 55].

The highest concentration of TCE in Johnson Avenue Well No. 6 was detected at 34.8 μg/L on September 6, 1988. This concentration exceeds the MCL for TCE by nearly seven times. On January 17, 1995, the concentration of TCE was detected at 21.0 μg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in Johnson Avenue Well No. 6 has further diminished to 13 μg/L. Despite the steady decline of TCE in this well, the current concentration exceeds the MCL by more than two times [15; 50; 55].

The concentrations of TCE in the FIP and Johnson Avenue Wells have consistently declined over time. All concentrations, originally significantly above the MCL, have diminished to below the MCL, with the exception of Johnson Avenue Well No. 6, which is still greater than two times the MCL. For the purposes of this SIP, TCE may be considered attributable to the manufacturing processes at the Mallory property, since it was detected in the 1994 on-site soil sample collected by the CT DEP from the bottom of the drywell [29]. TCE may degrade in soils and groundwater to cis-1,2-DCE and vinyl chloride [66; 67].

Tetrachloroethylene

PCE has not been previously detected in FIP Well No 1. The highest concentration of PCE in FIP Well No. 2 was detected at 160 μg/L on June 2, 1975. This concentration exceeds the MCL for PCE (established at 5 μg/L) by 32 times. The WESTON sampling event revealed that PCE has decreased to 25 μg/L in this well. This concentration still exceeds the MCL by five times [15; 50; 55].

The highest concentration of PCE in FIP Well No. 3 was detected at 73 μg/L on June 2, 1975. On January 11, 1995, the concentration of PCE in this well had dropped to 1.2 μg/L. The WESTON sampling event indicated that PCE was not detected above detection limits in FIP Well No. 3 [15; 50; 55]. The highest concentration of PCE in FIP Well No. 4 was detected at 640 μg/L on June 2, 1975, at 128 times the MCL. As of October 28, 1994, the concentration had dropped to 1.5 μg/L. The July 12, 1995 WESTON sampling event revealed that the concentration of PCE had raised slightly to 2.7 μg/L. Despite the increase, the concentration remains below the MCL [15; 50].

The highest concentration of PCE in Johnson Avenue Well No. 3 was detected at 60 μg/L on June 2, 1975, at twelve times the MCL. As of January 17, 1995, this concentration had decreased to 14.0 μg/L. The WESTON sampling event indicated that the concentration of PCE in Johnson Avenue Well No. 3 was still above the MCL, at 7.4 μg/L.

The highest concentration of PCE in Johnson Avenue Well No. 6 was detected at 5.8 μg/L on December 22, 1986, slightly above the MCL. As of January 17, 1995, this concentration had decreased to 3.1 μg/L. The WESTON sampling event indicated that the concentration of PCE in Johnson Avenue Well No. 6 had decreased to below detection limits [15; 50; 55].

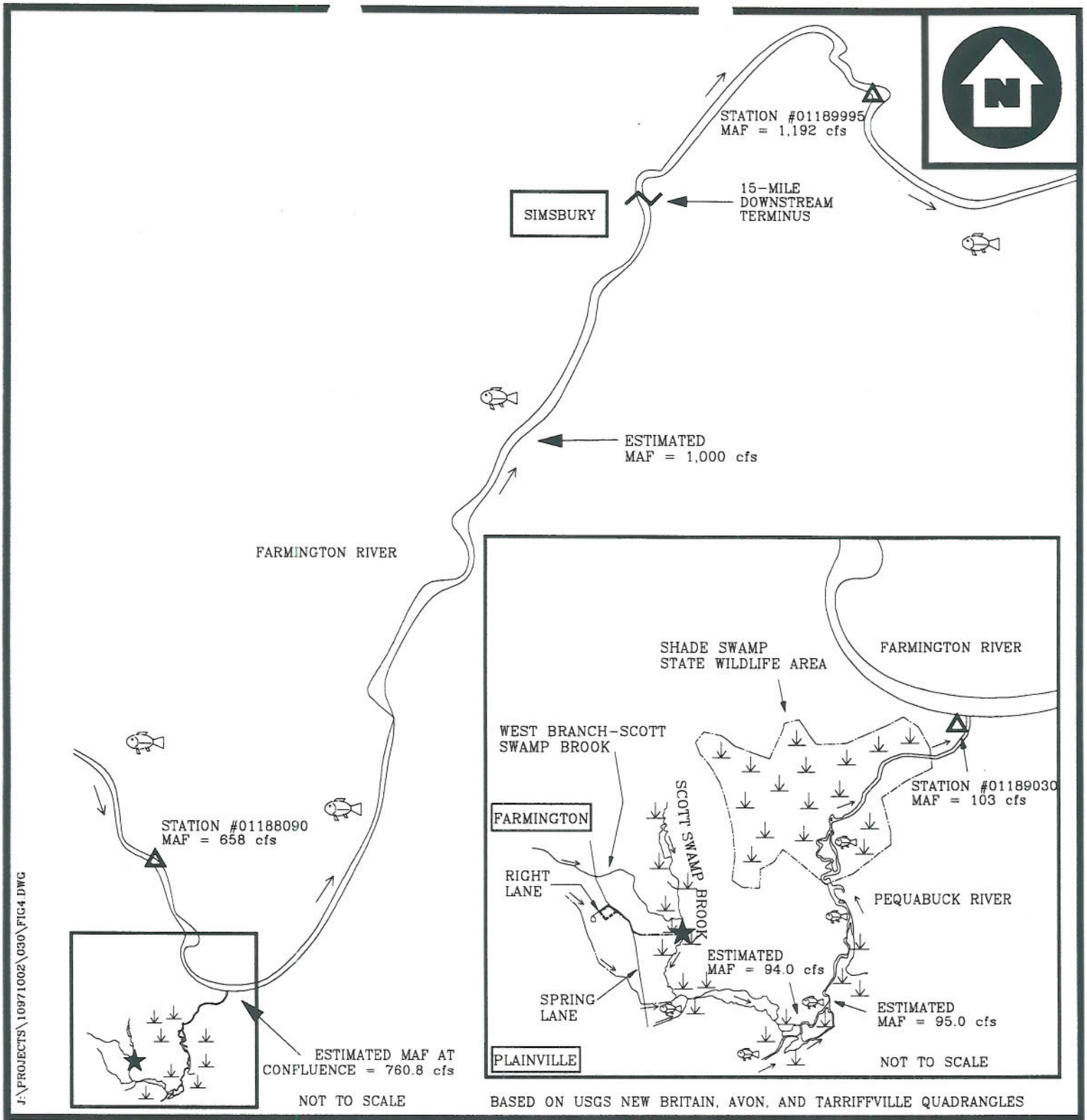
In general, PCE concentrations have steadily declined over time in the FIP and Johnson Avenue Wells; however, two of the drinking water wells, FIP Well No. 2 and Johnson Avenue Well No. 3, still contain concentrations above the MCL. For the purpose of this SIP, PCE may be considered attributable to the manufacturing processes at the Mallory property, since it has been detected in the 1994 on-site source soil sample collected by the CT DEP from the bottom of the drywell [29]. PCE may degrade in soils and groundwater to TCE, cis-1,2-DCE, and vinyl chloride [66; 67].

SURFACE WATER PATHWAY

Overland flow from the Mallory property is directed to the southeast and collected at a storm water catch basin along Spring Lane [30; 68]. Overland flow collected at the storm water catch basin travels south along Spring Lane and discharges to a drainage swale approximately 0.2 miles southeast of the Mallory property [30; 56]. The drainage swale joins a fairly diffuse intermittent stream channel which crosses several residential and commercial properties, mostly via an underground pipe, traveling south and southeast. The intermittent stream channel ultimately discharges to the probable point of entry (PPE) along Scott Swamp Brook just south of the confluence of the West Branch of Scott Swamp Brook and Scott Swamp Brook [56]. The total overland flow distance is approximately 0.52 miles [56]. It should be noted that the drainage swale and intermittent stream receive overland flow from several other industrial properties in the vicinity, and this overland flow route is not exclusive to the Mallory property [4].

Scott Swamp Brook travels east approximately 1.25 miles to discharge into the Pequabuck River, which travels approximately 2.32 miles north through the Shade Swamp State Wildlife Area to discharge into the Farmington River. The 15-mile downstream point from the Mallory property is located in the vicinity of the Route 315 bridge crossing the Farmington River in Simsbury, Connecticut (Figure 4) [57].

No known drinking water intakes are located within 15 downstream miles of the Mallory property [8, p. 51]. Scott Swamp Brook (downstream of Hyde Road in Farmington, Connecticut) and the Pequabuck River are considered fisheries, although neither water body is stocked (Figure 4) [53, p. 14-15; 62]. The Farmington River is one of Connecticut's premier trout fisheries. It is stocked by the State of Connecticut with trout and Atlantic Salmon at locations upstream and downstream of Farmington. The segment of the Farmington River downstream of the Mallory property is classified as a warm-water fishery by CT DEP, which is currently attempting to restore the Atlantic Salmon to the river [63]. No fisheries downstream of the property have been closed.



LEGEND

- PPE TO SURFACE WATER
- FISHERY
- USGS GAUGING STATION
- RIVER/STREAM
- MANMADE STREAM/SWALE
- MALLORY INDUSTRIES, INC.
- APPROXIMATE OVERLAND FLOW ROUTE
- WETLANDS
- FLOW DIRECTION

SURFACE WATER MIGRATION ROUTE

MALLORY INDUSTRIES, INC.
FARMINGTON, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 4

Table 12 summarizes the characteristics of the water bodies within 15-downstream miles of the Mallory property [49; 57].

Table 12

Water Bodies Along the 15-mile Downstream Pathway from Mallory Industries, Inc.

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
Scott Swamp Brook	Minimal stream	1.25	< 7.2	0.5
Pequabuck River	Small to moderate stream	1.54	94.0 to 100	1.2
Pequabuck River	Moderate to large stream	0.78	100 to 103	1.2
Farmington River	Moderate to large stream	9.23	761 to 1,000	0.1
Farmington River	Large stream to river	2.28	1,000 to 1,080	-

[a] = Minimal stream. Small to moderate steam. Moderate to large stream. Large stream to river. Very large river. Coastal tidal waters. Shallow ocean zone or Great Lake. Deep ocean zone or Great Lake. Three-mile mixing zone in quiet flowing river.

[b] = Flow rates are reported in cubic feet per second and were estimated using available U.S. Geological Survey gaging station information and from observations and field measurements made by WESTON.

A number of endangered/threatened species have been identified within four radial miles of the Mallory property, but available information does not indicate whether these environments are located along the downstream surface water drainage route from the property [64]. However, the Shade Swamp State Wildlife Area, located along the Pequabuck River approximately 1.5 to 2.3 miles downstream from the Mallory property, is noted by the CT DEP as containing sensitive environments (Figure 4) [65]. Table 13 summarizes sensitive environments located within 15 downstream miles of the Mallory property [24; 64; 65].

Table 13

Sensitive Environments Located Along the 15-Mile Downstream Pathway from Mallory Industries, Inc.

Sensitive Environment Name	Sensitive Environment Type	Water Body	Downstream Distance from PPE	Flow Rate at Environment
Scott Swamp Brook	Protected under Clean Water Act and State Natural Area	Scott Swamp Brook	0.0 miles	<4 cfs
Shade Swamp State Wildlife Area	State Wildlife Management Area	Pequabuck River	1.5 miles	96 cfs
Sandplain Gerardia (*Agalinis acuta*)	State-endangered species	Pequabuck River	1.5 miles	96 cfs
New England Grape (*Vitis novae-angliae*)	State species of Special Concern	Pequabuck River	1.5 miles	96 cfs

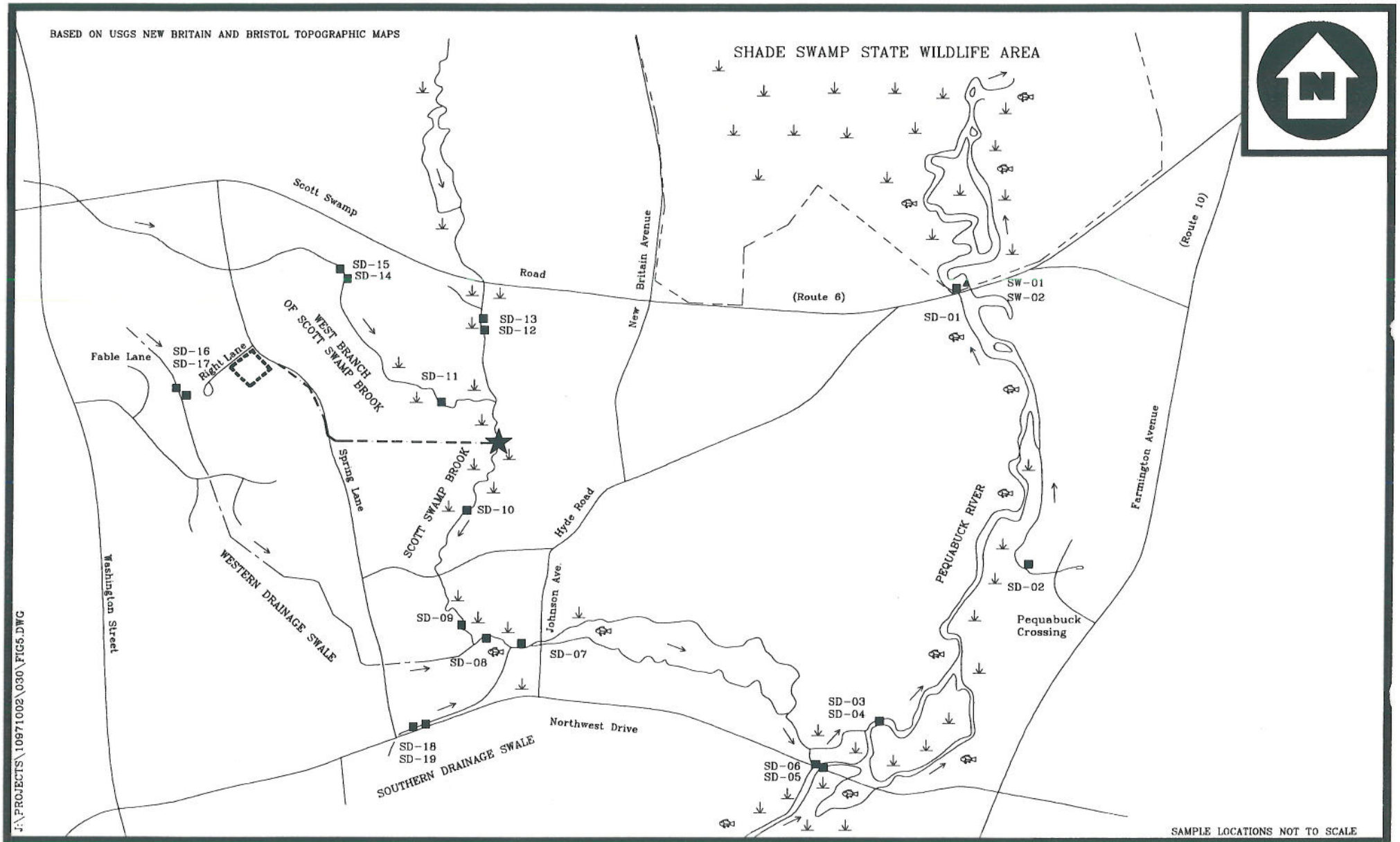
FIP Evaluation

The FIP properties for which WESTON is performing SIPs are a mixture of laboratories, metalworking, and machine shops. Processes which are common within the FIP and vicinity include laboratory work, metal working (cutting, milling, drilling, lathing, and grinding), degreasing, painting, metal plating, and machinery assembly. Various FIP properties being investigated by WESTON have, at one time, used chlorinated solvents in processes at their facilities, primarily for the purpose of metal degreasing prior to finishing. Prior to circa 1980, public sewer service was not available in the FIP; sanitary waste in the FIP was discharged to on-site septic systems, drywells, or some combination of these systems. Wastewaters generated from on-site processes, often containing solvents, chlorinated solvents, or inorganic elements, were often discharged to these same on-site disposal systems. Several properties disposed larger amounts of wastewater or non-contact cooling water directly to Scott Swamp Brook, its tributaries, or drainage systems which lead to Scott Swamp Brook.

After 1980, several FIP properties filed with EPA Region I under the requirements of RCRA as generators of hazardous waste. Under the RCRA program, CT DEP inspected these facilities every few years to verify compliance with hazardous waste disposal regulations. In general, on-site disposal of hazardous wastes ceased throughout the FIP between 1980 and 1983, when public sanitary sewer service was provided to the FIP properties, and wastes were diluted and discharged to this system.

Based on topographic surveys conducted by the Town of Farmington, as well as WESTON field observations, overland flow from the FIP properties travels via storm drains/drainage swales, intermittent/perennial streams, or directly to Scott Swamp Brook. Approximately 0.8 miles downstream of the FIP, Scott Swamp Brook joins the Pequabuck River, which is a fishery (Figure 4). Approximately 1.5 miles downstream of the FIP, the Pequabuck River enters the Shade Swamp Wildlife Management Area, which is an extensive alluvial swamp and habitat for a Federally-endangered species and a State species of special concern.

On July 12, 1995, WESTON collected 2 surface water and 21 sediment samples, including trip blank and equipment blank samples from the vicinity of the FIP to evaluate the surface water pathway. Sampling locations were selected based on the location of each property within the FIP, and to document, when possible, actual contamination from individual properties to the surface water pathway, including target fisheries and sensitive environments. Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses [53, pp. 39-40]. Table 14 summarizes sediment and surface water samples collected by WESTON on July 12, 1995 from the vicinity of the FIP to evaluate the surface water pathway and Figure 5 depicts WESTON sample locations [53, pp. 39-40].



LEGEND

- STATE WILDLIFE AREA PROPERTY LINE
- WETLAND
- SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- PPE TO SURFACE WATER
- MANMADE STREAM/SWALE
- STREAM/RIVER
- FISHERY
- APPROXIMATE OVERLAND FLOW ROUTE
- MALLORY INDUSTRIES, INC.

SURFACE WATER AND SEDIMENT SAMPLE LOCATION MAP

MALLORY INDUSTRIES, INC.
FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 5

Table 14

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: SEDIMENT				
SD-01	AHF02 MAGL19	0900	Grab (0 to 8 in.)	Sediment sample collected from the Shade Swamp Wildlife Area, 100 yards north of the Scott Swamp Road bridge over the Pequabuck River.
SD-02	AHF03 MAGL20	0925	Grab (0 to 8 in.)	Sediment sample collected to document potential contamination entering the Pequabuck River via an unnamed stream near Pequabuck Crossing.
SD-03	AHF04 MAGL21	0915	Grab (0 to 6 in.)	Sediment sample collected from the downstream discharge point from Scott Swamp Brook to the Pequabuck River (MS/MSD).
SD-04	AHF05 MAGL22	0915	Grab (0 to 6 in.)	Duplicate of sample SD-03 collected for quality control.
SD-05	AHF06 MAGL23	1000	Grab (0 to 6 in.)	Sediment sample collected upstream of the confluence of Scott Swamp Brook and the Pequabuck River, immediately downstream of the Northwest Drive bridge over the Pequabuck River.
SD-06	AHF07 MAGL24	1005	Grab (0 to 6 in.)	Sediment sample collected upstream of the confluence of Scott Swamp Brook and the Pequabuck River, immediately downstream of the Northwest Drive bridge over the Pequabuck River.
SD-07	AHF08 MAGL25	1025	Grab (0 to 8 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the southern drainage swale.
SD-08	AHF09 MAGL26	1115	Grab (0 to 8 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the western drainage swale.
SD-09	AHF10 MAGL27	1137	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08.
SD-10	AHF11 MAGL28	1135	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the west branch of Scott Swamp Brook, due west of the northern edge of the EBM building.

Table 14

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995 (continued)

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
SD-11	AHF12 MAGL29	1220	Grab (0 to 6 in.)	Sediment sample collected from wetlands along the west branch of Scott Swamp Brook, at the point where overland runoff from the Connecticut Spring and Stamping property enters the brook.
SD-12	AHF13 MAGL30	1300	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with a small tributary, 20 feet south of sample SD-13.
SD-13	AHF14 MAGL31	1310	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with a small tributary.
SD-14	AHF15 MAGL32	1420	Grab (0 to 6 in.)	Sediment sample collected from the west branch of Scott Swamp Brook, 50 feet upstream of the point where overland runoff from the New England Aircraft Plant No. 1 property enters the brook.
SD-15	AHF16 MAGL33	1430	Grab (0 to 6 in.)	Sediment sample collected from the west branch of Scott Swamp Brook, 75 feet upstream of the point where overland runoff from the New England Aircraft Plant No. 1 property enters the brook.
SD-16	AHF17 MAGL34	1432	Grab (6 to 8 in.)	Sediment sample collected from the western drainage swale, behind the residence at 8 Fable Lane.
SD-17	AHF18 MAGL35	1440	Grab (6 to 8 in.)	Sediment sample collected from the western drainage swale, behind the residence at 6 Fable Lane.
SD-18	AHF19 MAGL36	1241	Grab (6 to 8 in.)	Sediment sample collected from the southern drainage swale, 125 feet east of the intersection of Spring Lane and Northwest Drive.
SD-19	AHF20 MAGL37	1251	Grab (6 to 8 in.)	Sediment sample collected from the southern drainage swale, 175 feet east of the intersection of Spring Lane and Northwest Drive.

Table 14

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: AQUEOUS				
SW-01	AHF30 MAGL47	0850	Grab	Surface water sample collected from the Pequabuck River in the Shade Swamp Wildlife Area, 100 yards north of the Scott Swamp Road bridge.
SW-02	AHF31 MAGL48	0850	Grab	Duplicate of sample SW-01 collected for quality control.
TB-01	AHF34	0850	Grab	Trip blank sample collected for quality control.
RB-01	AHF32 MAGL50	0920	Grab	Rinsate blank sample collected for quality control.

MS/MSD = Matrix Spike/Matrix Spike Duplicate.

During the FIP WESTON environmental sampling event, eleven reference sediment samples were collected to determine background conditions for the area in the vicinity of the FIP. The reference sample locations were selected based on their upstream location from potential targets (Figure 5). Due to the variable concentrations of inorganic elements in natural sediments, reference samples were generally collected in pairs. In addition, WESTON collected eight target sediment samples to evaluate whether releases to surface water have occurred to Scott Swamp Brook or to the Pequabuck River; replicate and duplicate samples, a rinsate blank sample, and a trip blank sample were also collected to evaluate the surface water pathway in the vicinity of the FIP.

The following sediment samples were collected along the surface water pathway to evaluate observed releases and actual contamination targets which may be attributable to properties that are part of the FIP. Sample SD-01 was collected from the Shade Swamp Wildlife Area; SD-03/SD-04 were collected from the downstream discharge point from Scott Swamp Brook to the Pequabuck River; SD-07 was collected from the wetlands along Scott Swamp Brook downstream from its confluence with the FIP southern drainage swale; SD-08 was collected from the wetlands along Scott Swamp Brook downstream of its confluence with the western drainage swale; SD-09 was collected from the wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08; SD-10 was collected from wetlands along Scott Swamp Brook, downstream of its confluence with the West Branch of Scott Swamp Brook; SD-11 was collected from wetlands along the West Branch of Scott Swamp Brook; SD-11 was collected from wetlands along the West Branch of Scott Swamp Brook, at the point where overland runoff from the Connecticut Spring and Stamping property enters the brook.

Surface water samples, SW-01 and SW-02, were collected within the Shade Swamp Wildlife Area to document the level of contamination within that sensitive environment. No other surface water samples were collected by WESTON. As previously stated, sediment sample SD-01 was also collected within Scott Swamp Brook, along with complete reference location samples documenting upstream concentrations. If sediment sample SD-01 reported observed release substances at the Shade Swamp Wildlife Area, the surface water samples would be used to determine if those substances exceeded applicable surface water quality benchmark values. Based on this rationale, no upstream reference surface water samples were collected.

The following table summarizes sediment samples collected along the West Branch of Scott Swamp Brook, Scott Swamp Brook, and the Pequabuck River to evaluate observed releases and targets within these water bodies, and the corresponding reference samples used to establish reference concentrations upstream of the FIP.

Sediment Sample No.	Spacial Location	Reference Sample Numbers
SD-01	Shade Swamp Wildlife Area; Pequabuck River	SD-02, SD-05, SD-06, SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-03/4	Wetlands; Pequabuck River	SD-05, SD-06, SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-07	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-08	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15, SD-16, SD-17
SD-09	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15
SD-10	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15
SD-11	Wetlands; West Branch of Scott Swamp Brook	SD-14, SD-15

Table 15 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON sediment samples collected on July 12, 1995. A complete listing of analytical results is included in Attachment F. For each sample location, a compound or element is listed if it was detected at three times or greater than the appropriate reference sample concentration as described in the previous paragraphs. However, if the compound or element was not detected in the reference sample, the reference SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 15

Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995

Sample Location No.	Compound/Element	Concentration		Reference Concentration		Comments
SD-01 AHF02 MAGL19	**INORGANICS**					
	Chromium	159	mg/kg	42.6	mg/kg	3.7 × REF
SD-07 AHF08 MAGL25	**INORGANICS**					
	Selenium	0.84	mg/kg	0.81	U mg/kg	1.04 × SDL
SD-08 AHF09 MAGL26	**VOC**					
	2-Butanone	90	µg/kg	15	U µg/kg	6.0 × SQL
	Toluene	29	µg/kg	15	U µg/kg	1.93 × SQL
	PESTICIDE/PCB					
	4,4'-DDD	28	J µg/kg	4.9	UJ µg/kg	5.7 × SQL
	INORGANICS					
	Chromium	611	mg/kg	20.7	mg/kg	29.5 × REF
	Copper	93.4	J mg/kg	7.6	UJ mg/kg	12.3 × SDL
	Selenium	17.9	mg/kg	0.81	U mg/kg	22.1 × SDL
	Zinc	265	mg/kg	26.7	mg/kg	9.9 × REF
SD-09 AHF10 MAGL27	**SVOCS**					
	Di-n-butylphthalate	570	J µg/kg	490	U µg/kg	1.2 × SQL
	Bis(2-ethylhexyl)phthalate	860	J µg/kg	490	U µg/kg	1.8 × SQL
	PESTICIDE/PCB					
	4,4'-DDE	11	J µg/kg	4.9	UJ µg/kg	2.2 × SQL
	4,4'-DDD	43	J µg/kg	4.9	UJ µg/kg	8.8 × SQL
	INORGANICS					
	Arsenic	5.2	mg/kg	2.5	U mg/kg	2.1 × SDL
	Cadmium	1.6	mg/kg	0.32	U mg/kg	5.0 × SDL
	Chromium	195	mg/kg	20.7	mg/kg	9.4 × REF
	Copper	50.6	J mg/kg	7.6	UJ mg/kg	6.7 × SDL
	Lead	74.1	mg/kg	21.6	mg/kg	3.4 × REF
	Mercury	0.17	mg/kg	0.08	U mg/kg	2.1 × SDL
	Selenium	7.7	mg/kg	0.81	U mg/kg	9.5 × SDL
	Zinc	209	mg/kg	26.7	mg/kg	7.8 × REF

Table 15

Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Compound/Element	Concentration		Reference Concentration		Comments
SD-11 AHF12 MAGL29	VOCS					
	TCE	17	µg/kg	12	U µg/kg	1.4 × SQL
	PCE	65	µg/kg	12	U µg/kg	5.4 × SQL

UJ = The compound was analyzed for; but was not detected. The SQL is an estimated quantity.

Four VOCs, 2-butanone, toluene, TCE and PCE, were detected between 1.4 and 6.0 times the SQL in sediment samples collected from wetlands along Scott Swamp Brook and the West Branch of Scott Swamp Brook. The detection of TCE and PCE in sediment sample SD-11 is consistent with past use of chlorinated solvents at the properties in the FIP and with substances detected in groundwater samples collected from public drinking water wells in the area. No other VOCs were detected in sediment samples collected by WESTON.

Two SVOCs, di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in sediment sample SD-09 at 1.2 and 1.8 times the SQL, respectively [55]. SD-09 was collected from the wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08. The concentrations associated with the SVOCs detected in sample SD-09 were estimated. WESTON has included the detected concentrations of these SVOCs to remain consistent with technical directives provided by EPA Region I. Two pesticides were also detected in WESTON sediment samples; however, based on operational records provided by the properties that WESTON is conducting SIP investigations and prior analytical results of samples collected from FIP properties under WESTON SIP investigations; these pesticides will not be considered attributable to the Mallory property for the purposes of this SIP. Further, pesticides are ubiquitous in the environment and are used for routine pest and foliage control.

Eight inorganic elements were detected in WESTON sediment samples ranging between 1.04 times the SDL (selenium) and 29.5 times the reference concentration (chromium). Values associated with the inorganic element copper at sample locations SD-08 and SD-09 were estimated [50]. WESTON has included the detected concentrations of this inorganic element to remain consistent with technical directives provided by EPA Region I. No other substances were detected in WESTON sediment samples.

Surface water samples were collected within the Shade Swamp Wildlife Area to document the level of contamination within that sensitive environment. No other surface water samples were collected by WESTON. Sediment samples were also collected with complete reference location samples, documenting upstream concentrations. If sediment sample SD-01 reported observed

release substances at the Shade Swamp Wildlife Area, surface water samples would be used to determine if those substances exceeded applicable surface water quality benchmark values. Based on this rationale, no upstream reference surface water samples were collected. Surface water sample results were compared with the Ambient Water Quality Criteria (AWQC) and the Ambient Aquatic Life Advisory Concentration (AALAC) benchmarks [16; 50; 55].

Table 16 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON surface water samples [16; 50; 55].

Table 16

Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995

Sample Location No.	Compound/Element	Concentration (µg/L)	Benchmark Concentration (µg/L)	Comments
SW-01 AHF30 MAGL47	**INORGANICS**			
	Aluminum	472 J	--	NA
	Barium	39.1 J	--	NA
	Calcium	10,700 J	--	NA
	Iron	1,180 J	1,000	1.18 x BM
	Lead	10.1 J	3.2	3.16 x BM
	Magnesium	1,970 J	--	NA
	Manganese	134 J	--	NA
	Nickel	6.4 J	160	Below BM
	Potassium	3,330 J	--	NA
	Sodium	16,000 J	--	
SW-02 AHF31 MAGL48	**INORGANICS**			
	Aluminum	442 J	--	NA
	Barium	39.1 J	--	NA
	Calcium	10,800 J	--	NA
	Iron	1,120 J	1,000	1.12 x BM
	Lead	10.1 J	3.2	3.16 x BM
	Magnesium	2,000 J	--	NA

Table 16

Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Compound/Element	Concentration (µg/L)	Benchmark Concentration (µg/L)	Comments
SW-02 (concluded)	Manganese	133 J	--	NA
	Nickel	8.3 J	160	Below BM
	Potassium	3,260 J	--	NA
	Sodium	16,000 J	--	NA

-- = No AWQC/AALAC Benchmark is provided for this contaminant.
BM = AWQC and AALAC Benchmark used as the ecological-based standard.

There were no elevated levels of VOCs, SVOCs, pesticides, or PCBs detected in surface water samples collected by WESTON on July 12, 1995. However, both SW-01 and SW-02 revealed elevated concentrations of ten inorganic elements. Of the ten inorganic elements detected, only two, iron and lead, exceeded environmental benchmarks. None of the inorganic elements detected in surface water samples SW-01 and SW-02 were detected in sediment sample SD-01 [15; 16; 50; 55]. The complete analytical results of the WESTON sampling are included in Attachment F.

SOIL EXPOSURE PATHWAY

There are no on-site residents at the Mallory property; however, 33 full-time workers are employed at the Mallory manufacturing building [2, p. 1]. Properties adjacent to Mallory are not likely susceptible to on-site surficial migration of contamination, with the exception of properties adjacent to the drainage swale which receives overland runoff from the Mallory property [2, p. 1]. The Mallory property can be accessed from the north using Right Lane [30; 68]. There are no fences or gates surrounding the property [2].

Of the ten NUS/FIT on-site source soil samples collected in August 1989, four soil samples (SS-04 to SS-07) were collected at depths of two feet or less and may be used to characterize surficial soil contamination on the Mallory property [1, Table 3]. No VOCs were detected in any of the soil samples collected by NUS/FIT; however, one SVOC (fluoranthene) and six inorganic elements (aluminum, barium, beryllium, chromium, lead, and zinc) were detected above reference values in the samples. Based on the NUS/FIT sample results, an estimated 40,000 sq ft of soil contamination will be assumed for the purposes of this SIP. The NUS/FIT sampling event is discussed in further detail in the Waste/Source Sampling Section of this report and the complete analytical results of the NUS/FIT sampling are included in Attachment A.

The nearest residence to the property is located approximately 900 feet south of the property at 29 Wells Drive, Farmington, Connecticut (Figure 1A) [30]. Approximately 2,633 people live within one radial mile of the Mallory property, not including on-site workers [6]. No terrestrial sensitive environments are located on the Mallory property [2]. There are no schools or day-care centers within 200 feet of the on-site source areas [53, p. 10].

AIR PATHWAY

The nearest individuals to the Mallory property are the 33 full-time workers [2, p. 2]. The nearest residence to the property is located approximately 900 feet south of the property, at 29 Wells Drive (Figure 2) [4]. The nearest school is the Wheeler Elementary School, which has an enrollment of an estimated 376 students and is located approximately 1.5 miles south of the Mallory property [53]. An estimated 88,389 people live within a four-mile radius of the Mallory property, not including on-site workers [6]. No sensitive environments are located on the property. Table 17 summarizes the residential population located within four radial miles of the Mallory property [15].

Table 17

Estimated Population within Four Miles of Mallory Industries, Inc.

Radial Distance from Mallory (miles)	Estimated Population
On-site	33
0.00 < 0.25	164
0.25 < 0.50	497
0.50 < 1.00	1,972
1.00 < 2.00	16,020
2.00 < 3.00	29,781
3.00 < 4.00	39,955
TOTAL	**88,422**

The nearest off-site wetland is located approximately 0.5 to 1.0 miles southeast of the property along the Scott Swamp Brook and occupies approximately 0.37 acres (Figure 1). There are no wetlands located within 0.25 radial miles of the property. The approximate total wetland acreage within four-radial miles of the property is 1,990 acres [7]. Several sensitive environments are located within four-radial miles of the property. Table 18 summarizes the sensitive environments located within four miles of the Mallory property [58; 59; 60; 61; 64; 65]. Sensitive environments listed on Table 18 which are available to the surface water pathway have also been discussed in that section of this report.

Table 18

Sensitive Environments Located within Four Miles of Mallory Industries, Inc.

Radial Distance from Mallory (miles)	Sensitive Environment/Species (status)
0.00 < 0.25	0 acres of wetlands
0.25 < 0.50	0 acres of wetlands
0.50 < 1.00	Scott Swamp Brook (Clean Water Act)
	0.37 acres of wetlands
	Agalinis acuta (Federal and State Endangered)
1.00 < 2.00	1,295 acres of wetlands
	Vitis novae-angliae (State Special Concern)
	Lygodium palmatum (State Special Concern)
2.00 < 3.00	322 acres of wetlands
	Apectrum hyemale (State Special Concern)
	Hydrophyllum virginianum (State Special Concern)
	Dicentra canadensis (State Threatened)
	Dryopteris goldiana (State Threatened)
3.00 < 4.00	373 acres of wetlands
	Hydrastis canadensis (State Endangered)
	Dicentra canadensis (State Threatened)
	Platanthera Dilatata (State Special Concern)

No known prior air sampling has been performed at the Mallory property. WESTON personnel conducted air monitoring on June 19, 1995 during the on-site reconnaissance, utilizing a photoionization detector. No readings above background were detected [2, p. 2].

SUMMARY

The Mallory Industries, Inc. (Mallory) property is located in the Farmington Industrial Park (FIP) at 33 Spring Lane, Farmington, Hartford County, Connecticut at geographic coordinates 41° 42' 07.3" north latitude and 72° 52' 23.4" west longitude. According to the Farmington Town Assessor, the Mallory property is depicted on Map 77, Lot No. 22. The Mallory property is approximately 3.7 acres and is occupied by a 22,000-square foot (sg ft) single story manufacturing building. The property is currently owned and operated by Mr. Edwin C. Mallory.

Mallory began operations at this location in 1965. Mallory is an active manufacturing company, currently producing parts for aircraft and other machinery. The surrounding area is zoned for mixed industrial use. The property is abutted to the northwest by Right Lane, to the northeast by Spring Lane, to the southeast by Edmunds Manufacturing Company, and to the southwest by Dell Manufacturing Company.

The Mallory property can be accessed from the north using Right Lane. There are no fences or gates surrounding the property. Paved parking areas are located along the northwest, west, and southwest sides of the manufacturing building. An active loading dock is located along the west side of the manufacturing building. The south and southeastern perimeter of the property is wooded; the remainder of the property is covered by maintained lawns. The property slopes gradually from the northwest to the southeast.

Prior to development in 1965, the Mallory property and surrounding properties were used for agricultural purposes. Mallory began operating at its current location in 1965. The property is currently owned by Mr. Mallory. No known previous owners of the Mallory property were identified. Mallory has been a manufacturer of aircraft and machine parts since 1965. Processes used at the manufacturing building include but are not limited to; general metal machining (drilling, turning, grinding, and, milling), acid dipping and washing, and parts degreasing. Processes at Mallory have remained relatively unchanged since 1965; however, chemicals used and wastes generated at the property may have varied throughout Mallory operational history due to industry technological advances. Wastes generated from on-site operations include waste oils, mineral spirits, solvents, treatment sludge from the wastewater treatment system, scrap metals, and process wastewater from on-site manufacturing processes.

In November 1970, a Connecticut Water Resources Commission (CT WRC) inspection reported that wastes generated from manufacturing processes at Mallory included scrap metal, water soluble oils, detergents, and abrasive stone. Sanitary wastes were reportedly "discharged to the ground".

In February 1980, a Connecticut Department of Environmental Protection (CT DEP) inspection documented the discharge of wastes from the tumbling operation to on-site floor drains and septic system. The inspection also stated that waste solvents and oils were collected in a 550-gallon holding tank and hauled off-site. Previously, these wastes were reportedly stored in 55-gallon drums staged within the manufacturing building. At the time of the inspection, sanitary wastes were discharged to the septic system. Wastes from the tumbling operation consisted of water soluble oils, mineral spirits, alkaline soap solution, nitric acid, phosphoric acid, and hot water. The exact period that this practice had occurred is not known.

In 1981, Mallory filed a notification of Hazardous Waste Activity with the Environmental Protection Agency (EPA) (EPA ID CVS024248900). In connection with that notification, Mallory was designated as a large quantity generator with EPA identification number CTD001148568.

According to a CT DEP underground storage tank (UST) Facility Notification Form, the 550-gallon UST was removed in 1983. According to the UST Facility Notification Form, this tank was installed in January 1976; however, according to an EPA Notification of Hazardous Waste

Site form and the NUS/FIT PA, the 550-gallon UST had been installed in 1978. No known confirmatory samples associated with the UST removal are available. In addition, no information is available regarding the disposal of the UST. In 1983, a new 550-gallon waste solvent UST and a new 550-gallon waste oil UST were installed along the southwest corner of the manufacturing building.

In March 1983, the NUS Corporation Field Investigation Team (NUS/FIT) completed a Preliminary Assessment (PA) Report of the Mallory property.

In July 1985, Burton and Van Houten Engineers, Inc., of West Hartford, Connecticut completed an engineering proposal for a new wastewater treatment system for Mallory. In 1986, Mallory completed the installation of the wastewater treatment system. From approximately 1965 to 1986, wastewater generated during manufacturing processes at Mallory was reportedly discharged to the on-site drywell located along the northeast side of the manufacturing building. Wastewater discharge to the drywell reportedly ceased once the wastewater treatment system went on-line. Wastewater processed through the wastewater treatment system has since been discharged to the municipal sewer system. The waste treatment sludge produced during the wastewater treatment process is disposed of off-site. In 1987, Mallory reportedly sealed the floor drains which lead to the sanitary sewer. No additional information is available regarding this event.

In August 1989, NUS/FIT conducted an on-site reconnaissance and environmental sampling at the Mallory property as part of a Screening Site Inspection (SSI). NUS/FIT collected ten soil samples from the Mallory property which were analyzed through the EPA Contract Laboratory Program (CLP) for target compound list organics and target analyte list metals. NUS/FIT sample results reported one semivolatile organic compound (SVOC) and six inorganic elements.

In addition to the NUS/FIT on-site samples, three soil samples were collected by CT DEP on August 14, 1989 from various locations on the Mallory property. CT DEP soil samples were analyzed for hydrocarbons and chlorinated solvents; however, the exact analytical method used is not known. Laboratory results indicated that there were no hydrocarbons or chlorinated solvents present in CT DEP on-site soil samples. The exact locations where CT DEP soil samples were collected from the Mallory property are not known.

In 1994, CT DEP conducted additional on-site soil sampling to evaluate conditions at the Mallory property. CT DEP collected one soil sample from the bottom of the drywell located along the northeast side of the manufacturing building. The exact analytical method used to analyze the soil sample is not known. Laboratory results indicated that 16 organic substances were detected.

On June 19, 1995, Roy F. Weston, Inc. (WESTON) conducted an on-site reconnaissance to evaluate present on-site conditions at the Mallory property. On July 12, 1995, WESTON collected eleven groundwater, 21 sediment and two surface water samples at locations up-gradient and down-gradient of the Mallory property. WESTON samples were submitted through the EPA CLP for volatile organic compound (VOC), SVOC, pesticide, polychlorinated biphenyl (PCB), total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory.

According to state file information, The Connecticut Department of Health Services (CT DHS) initially collected and analyzed samples from the four FIP wells and Johnson Avenue Well No. 3 in June 1975. Available records indicate that the Johnson Avenue Well No. 6 was first sampled in June 1982. Analytical results from the June 1975 sampling round of the four FIP wells and Johnson Avenue Well No. 3 indicated the presence of several VOCs at concentrations ranging from 20 to 1,000 parts per billion (ppb). The compounds present at the highest concentrations from the June 1975 sampling round included 1,1,1-trichloroethane (1,1,1-TCA) at 1,000 ppb, chloroform at 680 tetrachloroethylene (PCE) at 640 ppb, and trichloroethylene (TCE) at 430 ppb. The highest concentrations of TCA, TCE, and chloroform were noted in samples collected from Johnson Avenue Well No. 3, and the highest concentration of PCE was detected in the sample collected from FIP Well No. 4.

Samples have been collected from the six affected wells intermittently from 1975 to the present, with the exception of Johnson Avenue Well No. 6, for which no analytical results are available prior to 1982. The concentration of chlorinated organics in the wells has generally decreased since their discovery in 1975, but were still present as of the latest sampling round conducted in, Spring 1995.

On July 12, 1995, WESTON collected eleven groundwater and drinking water samples from one monitoring well and eight public supply wells in the vicinity of the FIP, including a reference groundwater sample, replicate/duplicate samples, a rinsate blank sample, and a trip blank sample. Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory.

Comparisons can be drawn between historical drinking water analytical results and the more recent analytical results to determine trends of contamination. The following is a description of contaminants detected in the FIP and Johnson Avenue Wells and the relationship the substance to operational practices at the Mallory property.

- Chloroform - Based on the analytical results, it appears that the presence of chloroform in the FIP and Johnson Avenue Wells may have been an isolated incident. Chloroform does not appear to be a continuing source of contamination in the FIP and Johnson Avenue Wells. Based on operational records provided by Mallory and prior analytical data from on-site soil samples collected by NUS/FIT and CT DEP, chloroform is not considered attributable to Mallory for the purposes of this Site Inspection Prioritization (SIP).

- 1,1,1-Trichloroethane - Based on operational records provided by Mallory and prior on-site soil source samples collected by CT DEP and NUS/FIT, 1,1,1-TCA will not be considered attributable to Mallory for the purposes of this SIP. 1,1,1-TCA may degrade in soils and groundwater to 1,1-dichloroethylene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethylene (cis-1,2-DCE), chloroethane, vinyl chloride, and acetic acid.

- Trichloroethylene - For the purposes of this SIP, TCE may be considered attributable to the manufacturing processes at the Mallory property, since it has been detected in the 1994 on-site source soil sample collected by the CT DEP from the bottom of the drywell. TCE may degrade in soils and groundwater to cis-1,2-DCE and vinyl chloride.

- Tetrachloroethylene - For the purpose of this SIP, PCE may be considered attributable to the manufacturing processes at the Mallory property, since it has been detected in the 1994 on-site source soil sample collected by the CT DEP from the bottom of the drywell. PCE may degrade in soils and groundwater to TCE, cis-1,2-DCE, and vinyl chloride.

No known drinking water intakes are located within 15 downstream miles of the Mallory property. Scott Swamp Brook (downstream of Hyde Road in Farmington, Connecticut) and the Pequabuck River are considered fisheries, although neither water body is stocked. The Farmington River is one of Connecticut's premier trout fisheries. It is stocked by the State of Connecticut with trout and Atlantic Salmon at locations upstream and downstream of Farmington. The segment of the Farmington River downstream of the Mallory property is classified as a warm-water fishery by CT DEP, which is currently attempting to restore the Atlantic Salmon to the river. None of the fisheries downstream of the Mallory property have been closed.

The nearest individuals to the Mallory property are the 33 full-time workers. The nearest residence to the property is located approximately 900 feet south of the property, at 29 Wells Drive. The nearest school is the Wheeler Elementary School, which has an enrollment of an estimated 376 students and is located approximately 1.5 miles south of the Mallory property. An estimated 88,389 people live within a four-mile radius of the Mallory property, not including on-site workers. No sensitive environments are located on the property.

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ATTACHMENT A

MALLORY INDUSTRIES, INC.
SOIL SAMPLE ANALYTICAL RESULTS
NUS CORPORATION FIELD INVESTIGATION TEAM

Samples collected August 14, 1989

ATTACHMENT B

MALLORY INDUSTRIES, INC.
SOIL SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected August 14, 1989

ATTACHMENT C

MALLORY INDUSTRIES, INC.
SOIL SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected December 22, 1994

ATTACHMENT D

MALLORY INDUSTRIES, INC.
FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected from 1975 to 1989

ATTACHMENT E

MALLORY INDUSTRIES, INC.
FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE
ANALYTICAL RESULTS
UNIONVILLE AND PLAINVILLE WATER COMPANIES

Samples collected January 21, 1994 and January 26, 1995

ATTACHMENT F

MALLORY INDUSTRIES, INC.
GROUNDWATER, SEDIMENT, AND SURFACE WATER SAMPLE ANALYTICAL RESULTS
ROY F. WESTON, INC.

Samples collected July 12, 1995

ATTACHMENT A

MALLORY INDUSTRIES, INC.
SOIL SAMPLE ANALYTICAL RESULTS
NUS/FIT

Samples collected August 14, 1989

ATTACHMENT B

MALLORY INDUSTRIES, INC.
SOIL SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected August 14, 1989

ATTACHMENT C

MALLORY INDUSTRIES, INC.
SOIL SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected December 22, 1994

ATTACHMENT D

MALLORY INDUSTRIES, INC.
FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected from 1975 to 1989

ATTACHMENT E

MALLORY INDUSTRIES, INC.
FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE ANALYTICAL RESULTS
UNIONVILLE AND PLAINVILLE WATER COMPANIES

Samples collected January 21, 1994 and January 26, 1995

ATTACHMENT F

MALLORY INDUSTRIES, INC.
GROUNDWATER, SEDIMENT, AND SURFACE WATER SAMPLE ANALYTICAL RESULTS
ROY F. WESTON, INC.

Samples collected July 12, 1995